# CHEMICAL INDUSTRIES

FORMERLY KNOWN AS "CHEMICAL MARKETS"

VOLUME XXXVII DECEMBER, 1935 NUMBER 6

## Contents for December, 1935



**Regular Departments**



CHEMICAL INDUSTRIES *is indexed regularly in the* INDUSTRIAL ARTS INDEX



CHEMICAL INDUSTRIES is published monthly by Chemical Markets, Inc. WILLIAMS HAYNES, *President*; H. H. ADAMS, *Vice-President*; WILLIAM F. GEORGE, *Secretary-Treasurer.*

Published on the tenth day of each month at New Haven, Conn., and printed for the publishers by the Tuttle, Morehouse & Taylor Company.

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PUBLICATION OFFICE, NEW HAVEN, CONN. EDITORIAL AND ADVERTISING OFFICES, 25 SPRUCE ST., NEW YORK, N. Y.

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# *The Reader Writes:—*

## A Patent Hound

Chemical Industries is one magazine that I read from cover to cover. I learn something new with every copy, and it is well worth the price many times. U. S. patents interest me very much. I have about covered all the patents in the patent office here on polishes and cleaners and about two-thirds of them are not worth the paper they are written on. Playing poker with patents in the July issue is a very true article.

Washington, D. C. — Christian Smith

## Their Money Talks

I receive a considerable number of periodicals—some scientific, some strictly technical—but I need occasionally to post myself on trade matters. A weekly is not necessary; a monthly serves fully. This is where Chemical Industries comes in. It keeps me sufficiently in touch with markets and related things and also some very up-to-date things in technology which are very acceptable. All told, it is very well done and satisfactory—as witness my renewal for two years.

White Plains, N. Y. — H. E. Smith

The enclosed cheque should be evidence that your publication is acceptable. Personally, the inclusion of more abstracts of testing procedure and development would render the magazine more useful to me. Your editorials are always interesting, and I enjoy the gentle, witty vein. New products and processes, as well as patents, I always find useful and of interest. Current prices are sometimes of interest. In all the journal is entertaining and useful, and no conviction will be given this recommendation if I wax too fulsome.

San Francisco, Cal. — Clifford R. Stewart
Faber Petroleum Inspection Service

## Certified Chemical Accounts

I should like comment on your editorial, "Chemical Accounts" in the October issue of Chemical Industries. It seems to me that you somewhat hastily condemn an idea, which, though new and not yet in workable form, nevertheless holds great possibilities of future usefulness.

There is an ever increasing separation of ownership and management responsibility in American industry. More and more of our leading companies are owned by a multitude of stockholders whose ownership, thanks to the stock exchanges, is highly liquid. Managers, of necessity, are assuming more and more the character of trustees.

As a result, a problem which did not exist, or at any rate, was of minor importance when owners were few and were themselves, for the most part, directly engaged in management, is coming to have very great importance. It is: How can a management hold its stockholders' intelligent interest and inspire greater confidence in its own trusteeship, without furnishing its competitors with information which can be used against the company in its every day business?

The natural solution is to bring in a third party, who is, as nearly possible, impartial, and who has the capacity to understand the factors which measure the management's performance, and at the same time, has a professional reputation for honesty, ability, and clear thinking to maintain.

The usefulness of the certified public accountant to fill this position with respect to money matters, is now clearly recognized and widely accepted. His usefulness is not limited to inspiring the confidence of stockholders in a financial report to which he signs his name. The officers and directors of the company are relieved of a considerable burden of responsibility by reason of the fact that a disinterested and competent person reviews the accounting methods of the company, and checks the excellence of their application. Those who are primarily interested in accounting procedures and their operation, receive direct assistance in putting into effect, for the companies benefit, new ways of handling its account, which make the accounting department more efficient, and their own services better appreciated.

It can scarcely be argued that a management's technical ability and the measures it is taking to insure the company's future are less important than prudence and honesty in money matters. It is safe to say that the fact that few companies have considered the desirability of periodic impartial check-ups in such matters is due not to the belief that they are unimportant, but to the fact that they are so vital, that most managements instinctively shrink from the thought of taking any outsider, not directly controlled by the management, into the inner sanctum.

Before we reach the time when we have certified technical accountants, signing corporation reports and certifying to the ability and good sense of the technical management, we must first pass through the stage where management recognizes the advantages of impartial technical criticism, for its own use, and overcomes its instinctive reluctance to subject itself to such critical examination. We must also develop a group of technical accountants, who are capable of making such examinations and whose professional reputations are so firmly established, that management will feel justified in trusting them with vital information and will have confidence in their findings, and their ability to do their work without injuring organization morale.

These developments are going to take time. If the modern trend towards greater diffusion and greater liquidity of ownership continues, they are bound to come. Wall Street is the great promotor of diffused liquid ownership. Its future business depends on growing public acceptance of the system it promotes. It, therefore, has a very real stake in encouraging a development, which, properly handled, will increase public confidence in Wall Street investments.

Consequently, it is entirely logical that Wall Street should suggest "Chemical Accounts." The burden and the rewards of putting the suggestion to work, must remain with consultants and managers. Chemical Industries, I know, has the interests of both chemical consultants and chemical managers very much at heart. "Chemical Accounts" deserve somewhat more thoughtful treatment than you gave them in October.

New York City. — John P. Hubbell,
Singmaster & Breyer.

## Wilmington Papers Please Copy

I think Chemical Industries would be 100 per cent. if you omitted the editorials. They smack too much of that die-hard spirit which in the past few years helped the few at the expense of the many. I worked many years for H. H. Dow and saw him come from nothing to eclipse many concerns who had experienced pull and wealth. But I never heard "the old man" condemn any system unless he had something better to offer. I would not think of being without Chemical Industries. Your historical articles are fine. Your abstracts and news are excellent, convenient, and timely, and your patent abstracts invaluable to the busy man—but those editorials strike the wrong chord! They are rotten. Time will prove the new order is better. Ask Lammot du Pont. He is beginning to see the light.

Detroit, Mich. — P. A. Patterson


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# CHEMICAL INDUSTRIES

VOLUME XXXVII NUMBER 6


## *No N. R. A. Needed*

EFFORTS on the part of Coordinator-Major Berry to whip up enthusiasm for a revival of N. R. A. have met with an apathy among chemical manufacturers which surprises nobody in touch with this industry. Ten months ago in a secret ballot distributed by CHEMICAL INDUSTRIES, less than a tenth of the 180 chemical firms replying favored the continuance of N. R. A. and since the Supreme Court's decision certainly sentiment has not turned more favorably towards the Blue Eagle. The Chemical Alliance statement that today 98 per cent. of the chemical industry opposes any permanent agency of the nature of the defunct code authorities is quite correct.

To infer that this indicates a cantankerous position, lacking in cooperative spirit, is again to misread the temper and the needs of the chemical group. No chemical code is wanted because no chemical code is needed.

Voluntarily, the chemical industry omitted from their code any provisions to control prices or practices. Chemical makers smart under the blows of competition—at times unfair competition—and their prices are peculiarly sensitive to economic conditions. But they have learned well that this same competition is the mainspring of much chemical progress, and they do not subscribe to control either of prices or production as the best way to greater, more profitable markets.

When General Johnson asked for a 40 hour week and a 40c wage, over 90% of our chemical workers were paid upon this or a better basis. These better-than-code wages are still being paid. There is no child labor in the industry in fact, there are only 80 persons under 18 years of age reported as employed by our chemical companies; there is no need to control chemical working terms or conditions, and control, where not needed, is rather worse than useless.

### What Price Sugar?

In many parts of the world, alert, trained chemical brains are considering sugar, and we may expect some new developments of importance affecting this interesting hydrocarbon. Basically, the situation prompts the diligent search for cheaper methods of production and refining, since the world surplus is not easy to reduce.

Though the beet must always be protected in competition with cane, nevertheless most of Europe has resolved to be sugar-sufficient. Accordingly, we have tariff restriction of this large market at the same time that there is an artificial expansion of European production. Within the past five years both India and Turkey have doubled their per capita consumption of sugar, but at the same time they have so increased their production (from cane) that they are no longer important importers. Small wonder then that many competent observers are convinced that if the great sugar areas of Cuba and Porto Rico, Javas and the Philippines are not to be abandoned, sugar costs must be cut to increase consumption.

On the top of all this our Department of Agriculture and the Farm Chemurgic Council are doing their best to introduce the artichoke as a new cash crop, and at least one large wood chemical producer is seriously working on the technically feasible, but as yet commercially impractical, process of making sugar from sawdust. It begins to look as if the old dream of using this very pure and quite tractable hydrocarbon for industrial synthesis might in the not distant future become a reality.

### How Many Samples?

Akin to the catalogue hound who visits the Chemical Expositions armed with paper bags, valises, and other capacious receptacles for collecting trade literature is the sample hound who scans with eagle eye the technical press for the announcement of new chemical products and immediately writes for a sample.

Floods of such inquiries follow these announcements. Many come from colleges and consulting chemists and are inquiries of real interest and tangible value. But many also come from high school students and other curiosity seekers. So prevalent has the breed become, that it creates a real problem.

Even more important and serious, however, is the great number of requests received from what are rather obviously substantial industrial concerns, asking for "working samples" of new products. Such sample collectors are not satisfied with a few ounces. They demand pounds and even kegs or drums of the material. It is the natural instinct of a sales organization to be generous in the matter of samples. This is good business. But we have heard of late sufficient complaints to indicate plainly that this generosity is being abused, and not a few of our larger chemical companies are rather seriously considering the possibility of a charge for samples. So delicate a problem of sales policy deserves careful consideration, and it might be well for some of the trade associations to investigate this with the purpose of developing a sound, reasonable, and not-too-expensive set of rules for guidance.

### Price Stability in 1936

The 1936 prices for most important industrial chemicals remain unchanged, but a sufficient number have advanced to indicate definitely that extreme firmness will characterize the current contract season. Chlorine, with a three dollar a ton advance, points the way; the alkalies and ammonia schedules are being repeated; carbon tetrachloride, carbon bisulfide, sal ammoniac, caustic potash, sodium cyanide and potassium carbonate are among some of the other items on which existing prices have been extended. This condition is not an unexpected one. Prices are rising fast in all other raw materials' markets; consumption of basic materials, including chemical, is increasing at a rapid pace. Chemical prices are holding notably steady. Where lower prices have developed in the industrial chemical group, as for trisodium phosphate and zinc oxide, the causes are usually either competition from other chemicals or too-keen competition between producers for the restricted markets. A novel answer to the price question is the new anti-freeze alcohol marketing plan. Will it give to that industry a greater degree of stability? Not all the manufacturers believe in its ultimate success, and certainly, consumers are, in many cases, antagonistic. Nevertheless, even a limited success might prove intriguing to other divisions of the chemical industry struggling with severe price cutting practices.

## Quotation Marks

The Federal Government is running in the red more than $10,000,000 a day. And this in spite of the fact that tax dollars are pouring in at the fastest rate in fifteen years. The deficit for the year just passed was over three and one-half billion and the deficit for the current year is estimated to be close to four billion. *Edgar M. Queeny, Monsanto Current Events.*

## *John F. Tholl Discusses*

# Speed Versus Control in Chemical Production

**Drafted recently from the automobile industry to the vice-presidency of the American Tool & Machine Company, builders of centrifugals, Mr. Tholl's fresh, first-hand impressions of the chemical industries are vividly recorded in this interview.**

AN alert executive, whose business life has been spent in the most highly developed of all our mechanical industries and who is suddenly brought into daily contact with our chemical industries—what does he think of the methods and problems of process manufacturing? That question prompted this interview with John F. Tholl.

It is certainly a "leading question." Plainly, since he came to the chemical field with a reputation for hard-working common sense and driving initiative, we are apt to get a realistic reply. His candid opinion, I had been warned, was more likely to be embarrassing for its frankness than its flattery.

When I asked him this question, he leaned back in his swivel chair and looked at me with a quizzical smile for a long ten seconds, wondering, I suspect, why his busy morning should be interrupted by such inquiries. Then suddenly he snapped the chair forward, leaned across the desk, and after that one pause there was not another trace of hesitancy.

"One, big, fundamental distinction separates the technique of the mechanical from that of the chemical industries. Speed, speed, more speed in every detail of each operation is the goal in the fabricating industries. In the process industries, on the other hand, control, continuous control, elegance of control, more accurate and more automatic control is the major objective.

"That is a distinction," he continued, leaning back again, "that is a real difference. The manufacturer who is making fabricated things, whether he rolls out great sheets of metal or sews snappers on a woman's dress, makes more money the more quickly these operations can be performed. The manufacturer who is creating new goods by means of chemical changes increases his net profits most by controlling more and more carefully the conditions under which those chemical changes take place. Of course, the mechanical operation must be done accurately as well as speedily, and if you can cut down the time of a chemical reaction, you also cut down costs. But basically, this difference between the two great groups of modern industry is a distinction that has interesting and important results.

"Chemical people all appreciate the importance of chemical control, and I should appear foolish pointing out examples that emphasize an axiom; nevertheless, the development of sheet glass brings out one point that impresses me greatly in process technique.

"For long years, many people tried to produce sheet glass automatically and continuously. Ford was the

first to do it, and he was able to do so only when he was able to mix and melt batch after batch of complete and perfect uniformity—a triumph of control. Out of that control flows naturally a perfectly homogeneous, endless sheet of glass which is always of the same chemical composition, of the same texture, thickness, and weight. Without this hundred per cent. uniformity, it would not be possible at the next step to sandwich two sheets with cellulose to make safety glass. If the window glass were still made in batches, each varying to some degree in all characteristics, then the production of safety glass could not have become a continuous and automatic operation.

### Far-Reaching Effects of Control

"Accordingly, in the chemical industries I am struck continually by the far-reaching effects of control, effects that go back to raw materials and equipment, to smelter and foundry and machine shop and go forward to all sorts of new processes and new products. This is all 'old stuff' to the chemical executives and chemical plant operators; but it is what is most impressive to a newcomer."

"This distinction between control and speed in chemical and mechanical techniques," I suggested, "must make quite a difference to the chemical apparatus maker and the machine tool manufacturer."

"Of course it does," he went on smiling, "and if I can talk shop a moment, I can illustrate that difference. We make centrifugals, and, as has been known for over a century, the speed of a centrifugal machine is a function of the power it consumes. If speed were all we wanted all centrifugal machines would be operated on the belt line where we can get 1700 revolutions or more per minute; but because we want better control of the centrifugal force generated in the machine, we commonly use two speed motors, sometimes two, even three of them with a free wheeling device to control low speeds for unloading.

"Furthermore, through control we are twisting about the historic use of the centrifugal to separate solids from a liquid for complete removal to the use as an impregnator as when we employ it to replace the kier in dyeing operations. By packing the basket lightly with wool or cotton or rayon, pouring the dye liquor in the center and giving it all a swing in the centrifugal, we extract the dye by forcing it through the fibre again and again by alternate slowing and speeding up the machine. In the end, we can go a long way towards the complete drying of the dyed material by a final speeding up that drives off the dye liquor. All these are operations at carefully controlled speeds, and further than that we are constantly working with new alloys as materials of engineering in order to meet the constantly more exacting requirements of the process industries for centrifugal machines to handle all sorts of different corrosive liquids."

Very carefully Mr. Tholl lighted a long panetela and bringing his finger tips together watched the smoke curl across his large, bare, business-like office. After several moments of reflection, he went on again.

"I'm no psychologist, though they say it is something, like English prose, which we all use daily; but for lack of a better name there are some psychological differences between the chemical and the mechanical industries. In the first place, the chemist is more temperamental than the engineer. Maybe it is because he is so much more of a creative genius than his mechanical cousin. He is certainly more awake and yet at the same time more dreamy. Although more open-minded to new ideas, he is more difficult to convince because he will not accept either a mathematical proof or second-hand experience. As a result, we cannot keep a stock of standard machines on the shelf, and we cannot introduce a new design or a new principle in operation wholesale and quickly no matter how thoroughly we may have tested it out and how sincerely we may believe in it.

### Difficult Job of Selling

"In the automobile industry, each company puts out a new model, embodying changes and new ideas which are blown up by advertising till hell wouldn't hold them and the public accepts them. The car buyers may like one set of innovations better than another; but there is no refusal to purchase on the grounds of untried novelty.

"Throughout the chemical field it is all very different. Whether we are trying to sell some improved centrifugal or a chemical manufacturer is marketing, say, a new solvent, all along the line the buyer greets the new product with suspicion and must have every jot of its claimed advantages proved. We all of us have an infinitely more difficult selling job. But I am finding it infinitely more interesting."

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## New Talc Determinations

Use of talc in whiteware and clay refractories is becoming widespread and because of the promising results obtained, the Bureau of Standards through their *Technical News Bulletin* have deemed it advisable to publish fundamental data on the process and products of its thermal decomposition. A sample of nearly pure talc was investigated, determinations being made of the weight losses and accompanying changes in true specific gravity, and of heat effects. X-ray and microscopic examinations of the heated samples were also made. The results indicate that water in excess of one mol., and which is not held purely by adsorption or by capillarity, may be held electrostatically between basal cleavage planes, and was driven off mostly by heating between 380° and 500° C. This loss is not accompanied by any change in crystal structure. The remaining water was driven off between 800° and 840° C., resulting in a transformation of the talc to enstatite and amorphous silica. The inversion of the enstatite to clinoenstatite takes place gradually, being observable in material heated to 1200° C. and complete in material heated at 1300° C. The material heated at 1300° C. indicates also complete conversion of the amorphous silica to cristobalite.

# Controlling the Costs of Industrial Research

**By Gilbert Amerman**

**Accountant, Pease Laboratories, Inc.**

CONCENTRATION on the necessity for, and advantages of, scientific research work has almost blinded chemical management to the profit opportunities offered by business research and the scientific management methods so avidly installed by the mechanical industries. One has only to spend one day in a typical automobile plant and the next in a typical chemical plant to get the striking contrast between modern and obsolete management methods. The works manager of one color plant confessed that he knew nothing of motion study, except that it would not work; and this conversation took place in the routine testing laboratory, where the veriest tyro could see that the operators were unconsciously wasting at least half their time.

Chemical industry is thus in the unique position of being the leader in expenditures for scientific work and the laggard in expenditures for methods research.

In considering this problem of scientific administration of industrial research, the first step is carefully to list all the forms of research that show profit possibilities and then to analyze each type to determine whether or not a small-scale experiment to evaluate probable benefits is warranted. Only when the types, as well as the initial magnitude of each type, have been definitely decided upon, is it possible to proceed with a definite program of evaluation and control.

The first problem in actual administration is whether the work should be undertaken by the enterprise itself or by an outside consultant, in other words, the "buy or make" problem. Accurate costing is necessary, supplemented by a method of valuing the results whose costs have been determined. Finally, a definite system of financial administration of research must be installed, so that profit results are periodically available to management, as the basis for corrective action.

It is then possible more accurately to estimate the optimum, profitable research appropriation, as well as the most satisfactory amount to be allocated to each type or project. The total, as well as the proportions for different types, will, of course, vary from year to year, so that the results at a given time should be periodically re-examined.

The vital factors affecting the buy or make decision are: (1) volume of work; (2) repetitive character of work; (3) organization and nature of the enterprise; (4) labor utilization; (5) overhead considerations, and (6) intangible factors.

Very minor projects offer little difficulty. If personnel is available within the organization, they will be performed internally with little disturbance. If not, a reputable consultant will be engaged. As the magnitude of the project increases, however, volume becomes the most important single determinant. Likewise, a project which is obviously non-repetitive will be handled in the same way, except when of considerable magnitude.

If the research is clearly outside the normal scope of the business, the enterprise should undertake it only if a man of the requisite calibre, in whom complete confidence may be placed, is available. Also, future availability must be considered in the event of a resignation. Likewise, this executive will usually fit into the organization only in a purely staff capacity, hence the other branches of the business will not profit by improved coordination and by-product ideas to the extent that the addition of a department would normally lead one to expect. Even if these obstacles are overcome, management is continually confronted with very difficult evaluation and control factors. In short, the problem is the usual one of whether or not to branch out into a totally unrelated field and the right answer, as so many failures amply attest, is usually "No." For projects unrelated to the normal scope of the business, it is usually advisable to employ outside consultants.

Research conducted by the company's own staff requires both supervisory and direct labor, the economic utilization of which is primarily a question of the volume of work. This volume should be sufficient to permit engaging an executive competent not only to plan and supervise experimental work and interpret results, but also to discover difficulties requiring research, solve them, and then follow through until the results become profits. If small volume requires that a second-grade man be engaged, results may be unfortunate.

Volume of research must also be sufficient to permit this man to direct a reasonable number of technicians.

If he must do routine work himself, or volume does not permit engaging enough technicians over whom his high time-costs can be spread, labor project costs will obviously be high. Frequently, a young, enterprising executive with a single assistant can produce excellent results and develop results fast enough to warrant salary increases commensurate with his ability, but the absence of reasonable volume usually indicates that the work should not be done internally. Volume is usually the most important single factor on which the decision will hinge, since it determines the efficiency of the greatest cost factor, labor.

### Weighing Intangible Elements

While decidedly secondary to labor costs, the problem of overhead items is quite important. A research project requires space, equipment, supplies, and administration. Suitable quarters for research is an important consideration. Likewise, the capital outlay, and capital and operating charges against the required equipment, may be quite high for some projects and almost negligible for others. The term "supplies" covers everything from laboratory and office supplies to books and periodicals and is also highly variable. Administrative items cover both administrative labor and overhead, and its consideration ties in with the consideration of organization questions. The balance of total overhead charges against volume determines the question with respect to this factor.

A number of intangible elements, not so readily reducible to money values, must be weighed. Here, several factors favor doing the project internally. The management has complete control of the work at every stage and can increase pressure, permit the project to lag, drop it altogether, or completely change its direction immediately whenever such steps appear advisable without being hampered by contractual relations, physical limitations of the consultant's staff, or other demands on his efforts. Furthermore, complete information is available at any time on the progress of the project and the data necessary to correlate it with the primary, and possibly secondary, purposes for which the work was undertaken. It may also subsequently prove advantageous to have the man who actually did the work in the organization, since his background may be very helpful in applying the results, and he may discover ways in which by-products of the research may be used that could not possibly have occurred to the consultant because of his necessarily limited knowledge of the clients' problems. Moreover, the work may involve an essentially new technique, and while no reputable consultant would use any part of the results, it is conceivable that his employes might subconsciously use the method of attack so developed to the advantage of a competitor.

Under certain circumstances, however, the arguments for complete control of the project may favor the consultant. A first-grade organization, when allowed sufficient latitude, is frequently able to visualize the client's need better than he can himself, and so direct the work to the necessary objective much more expeditiously and economically. This is particularly true when the client has limited knowledge of the technical field involved, and makes a full and complete disclosure of all the pertinent circumstances. The most economical way of eliminating the lack of direct contact is frequently to have the man who did the work visit the premises until the results have been applied to the full satisfaction of the client. In certain fields, most of the consultant's recommendations may constitute common knowledge in the profession and competitors would eventually profit by them in any case. In certain other fields, it is customary for consultants to refuse to serve competing firms unless the nature of the project is so fundamentally different that no question of ethics could conceivably be raised.

To "buy or make" research must value several factors separately to sum up the right answer for any particular case. Many organizations could more economically do some work they now let to consultants; but still more persistently insist on wastefully and expensively performing research for which they are very poorly equipped, due to the fetish of many managers to have all development and control work under their direct control, whether they can intelligently manage it or not. There is an extensive economic field for both the outside and the internally conducted project, and sound administration requires that the distinction be drawn by the scientific use of sound economics.

### Costing Research

The extent of research work in the chemical industry necessitates a control over such expenditures which has been conspicuously absent in chemical development undertakings. The consultant frequently finds that a reasonable bill for research services is considered excessive by the client, the reason being that while the consultant must determine research costs accurately (if he expects to stay in business) the client has been accustomed to paying many of his internal research bills under other names.

The simplest and least effective method of so-called cost control consists in appropriating a certain number of payroll dollars to research workers, letting them work on the problems that present themselves until the latter are solved or the workers have given up, and varying the appropriations with changes in business conditions as the management sees fit. More progressive organizations use a research budget in terms of projects, consisting of both direct labor and burden components, which, if the burden is correctly calculated, is quite correct.

Three major pitfalls in this method are: (1) computations of total burden; (2) allocation on the basis of type of research activity, and (3) disposal of unsuccessful projects.

The tendency of managers, as well as accountants, is too often to consider research as overhead *in toto*. Consequently, they are too much concerned with its effect on manufacturing cost to give adequate attention to

detailed analysis. The research division should be considered a separate department of the business. It should stand or fall on its own profit and loss showing. Any other attitude means inevitable waste. There is some justification for tying fundamental research, which may not be liquidated for decades, to sales and net income; but bread and butter research must clearly be undertaken on the basis of estimated costs versus estimated returns for the individual project. Nothing short of stark realism will give costs that mean anything.

### Disposal of Unsuccessful Projects

In general, the total burden chargeable against research in most organizations is much too low. The items most commonly omitted, may be readily located by consulting the overhead items normally charged against production. There is also a formidable array of research costs frequently charged against manufacturing, administration, or other functions, such as time of executives not primarily research men, typing, stenographic and clerical services and the burden pertaining thereto, as well as general administrative costs.

A research project normally requires varying proportions of three basic types of activity: laboratory work, consultation, and clerical (including typing and stenography). The total time of a worker is divided between that spent on specific jobs and unproductive time. A mere consideration of the cost of operating certain types of scientific equipment, and the percentage unproductive time of a research worker on the one hand and a typist on the other, makes it perfectly obvious that the same overhead rate cannot by any stretch of the imagination be applied to the direct labor expended on each of these activities. Yet most organizations attempting to analyze research costs at all attempt to do just this. The author can conceive of no effective cost control system without the use of time cards by the workers, but how many now report their time as a matter of routine? This question of total burden and its allocation is touched quite sketchily, in spite of its importance, since a previous paper covers these two points in considerable detail.*

The disposal of unsuccessful projects, while impliedly covered in the former two, inspires much loose thinking. The factory manager understands that his units of product which have passed the quality standards established, must carry the total manufacturing cost burden, scrap being credited only on the basis of realized value. Yet the research director, in summarizing his year's operations, frequently distributes total overhead on all the projects undertaken, whether the results were good, bad, or indifferent. Reports on the unsuccessful projects, together with the memory of the costs thereby incurred, he leaves in his office, takes the successful ones with their so-called costs and proceeds into a directors meeting, and balances the results of these projects against the fictitious cost figures to demonstrate the profit possibilities of research as well as his own administrative genius. The amazing thing is that he gets away with it so often, and with at least the acquiescence of the accounting department. This method of making a loss look like an enticing profit escapes immediate detection only because of accounting mechanisms that do not recognize research as a separate branch of industrial activity.

To summarize, a research cost system must provide for (1) determination of total costs chargeable against research, (2) a method of distributing these costs to the various projects, (3) recognition of the fact that different types of research activity require different overhead rates, and (4) inclusion of *all* research costs in the costs of the final reports accepted as the finished products of the research department. It is, of course, understood that a research cost system should tie in with a research budget, as a division of a modern master budget.

### Valuing the Results

Nothing is simpler in theory or more difficult in practice than determining the value of the research product. The theoretical answer is, of course, what the completed project would sell for on the market. For certain types of projects, it is possible to get approximate quotations for having the work done by outside consultants, and in such cases this will yield the most accurate results. But in most cases involving much non-routine work, the only quotation possible will be a cost plus offer, since results and the time necessary to obtain them cannot be more than guessed at.

Another method of value determination employed with fair success is the practice of intracompany sales, the research division selling its services to other branches of the business as though it were a separate entity. If permission to get the work done outside the organization, if quality and price offered are not satisfactory, is given, and the particular type of research services has a sufficiently broad market to make competition really effective, the device works well. However, under these conditions, it would also be relatively easy to determine market value without this mechanism. If an outside source is used under this plan, fixed charges make the transaction result in a net loss to the company, even if the outside terms are more favorable. When the market is so thin that effective competition is out of the question, this device becomes purely perfunctory and is an actual evil, since it may give the impression that competition is effective, when there is none. This plan contributes nothing fundamental to the solution of the problem. It is at best a mechanism of continuous check, whose utility depends on the circumstances.

A third method frequently used is the profit accruing to the company as a result of the research work. This is frequently illusory because of failure to distinguish between the value of the work as such and the value of its application. For example, if it is possible to determine the market value of a certain piece of work and

* Amerman, G.—Accounting for Research Costs—Bulletin of the Taylor Society and of the S. I. E., July 1935, pp. 176-185.

also to determine that the net profit results were twice as much, then half of the total profit is the value of the scientific work of the research department, while the other half is business profit, a credit to the administrative department. This does not imply that the director of research should not receive whatever credit is due him for his part in the conception of the idea, but it does mean that such additional value should not be permitted to obscure other issues, such as the problem of having research done internally or externally.

For non-routine projects, necessity requires that value be a function of cost. The weakness of this assumption must be remembered, and management should always seek opportunities to apply spot checks in those cases where value can be determined, which will usually be fairly frequent. Management must also be alert not to buy something worth its purchase price, but which cannot be profitable to the particular organization at that price. And the ancient axiom of economics, so well known and obvious that it is sometimes ignored, will bear one more repetition—Cost in any particular case bears no necessary relationship whatsoever to value in that particular case, nor does market value bear any necessary relationship to financial utility to the organization.

### Valuing the Research Department

As must every division of a well managed enterprise, the research department must be evaluated on a profit basis. Many intangibles accrue whose value to the organization is difficult to estimate; but inability to measure exactly is no excuse for failure to attempt any form of measurement.

The most satisfactory method of control is a periodic departmental profit and loss statement. This should enumerate the costs of all projects undertaken during the period. The projects definitely accepted as satisfactory should then appear in a separate list, giving their total costs (including an allocation of the costs of the unsuccessful projects), their value on whatever basis it may be finally decided to estimate value, and the profit or loss, these figures adding up to total cost, total value, and total profit or loss for the period.

Intangible values are prestige, publicity, and whatever the management wants sufficiently to pay good money for under the circumstances. These should be enumerated and a value set on each for the period by means of a management appraisal. The financial profit or loss for the period plus the sum of these estimated valuations then give financial performance as nearly as it can be estimated in dollars. The final precision, of course, leaves much to be desired, but it is decidedly preferable to simple guessing.

The efficiency of assistant directors, responsible for certain types of projects, may be estimated by deriving a sub-departmental cost on the basis of the projects they supervise alone. Total costs have been distributed on total accepted products, for the research department as a whole. If total costs of any division of the research department are distributed on total accepted products of that division only, a different and fictitious cost is derived, which would, however, be suitable for the single purpose of measuring the cost efficiency of any particular division. Value would be the same as in the determination for the entire department. If fundamentally different types of research are done, this entire analysis should be applied to each unit, considered as a separate department.

The success of such a measurement plan depends on the attitude of the director of research. The importance of selecting a man thoroughly in sympathy with the concept of a research department as a profit yielding entity can hardly be overestimated. He need not be familiar with the details of modern cost control, but he certainly should be eager to cooperate in their application.

Research costs have forced their attention on chemical executives, particularly during the recent lean years, and the problem of evaluating different types of research, as well as projects within each type and selecting those promising the maximum net return, has at least been recognized. Control of research on sound financial principles is as welcome to the sincere and thoughtful research executive as it is to the financial executive. Chemical research can be put on a much sounder fundamental basis than it has ever been able to boast hitherto.

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## *Industry's Bookshelf*

**Fundamentals of Economic Geography,** by Nels A. Bengtson and Willem Van Royen, 802 pp. Prentice-Hall. $5.00.

Profusely illustrated and well organized, this text is designed for use as an introductory course in college geography. The authors believe that, owing to its close relationship with economic study, geography should be a part of every college course and have thus designed their book for minds considerably more mature than the average high school student. An excellent contribution to the growing list of economic texts.

**Laboratory and Workbook Units in Chemistry,** by Maurice U. Ames and Bernard Jaffe, 241 pp. Silver, Burdett.

A well organized laboratory manual which emphasizes principles and fundamentals as well as the mechanics of operation. Published in book form and in detachable, loose-leaf form.

**The Principles of Experimental and Theoretical Electrochemistry,** by Malcom Dole, 549pp. McGraw-Hill. $9.00.

Defining electrochemistry as that body of knowledge accumulated through the application of electrical instruments, electric measuring devices, etc., to the solutions of the problems of chemistry, the author discusses electrochemical principles from the modern mathematical-electrical viewpoint. An excellent addition to this large series of chemical texts.

# *Waxes*—

## Animal — Mineral

## Vegetable — Synthetic

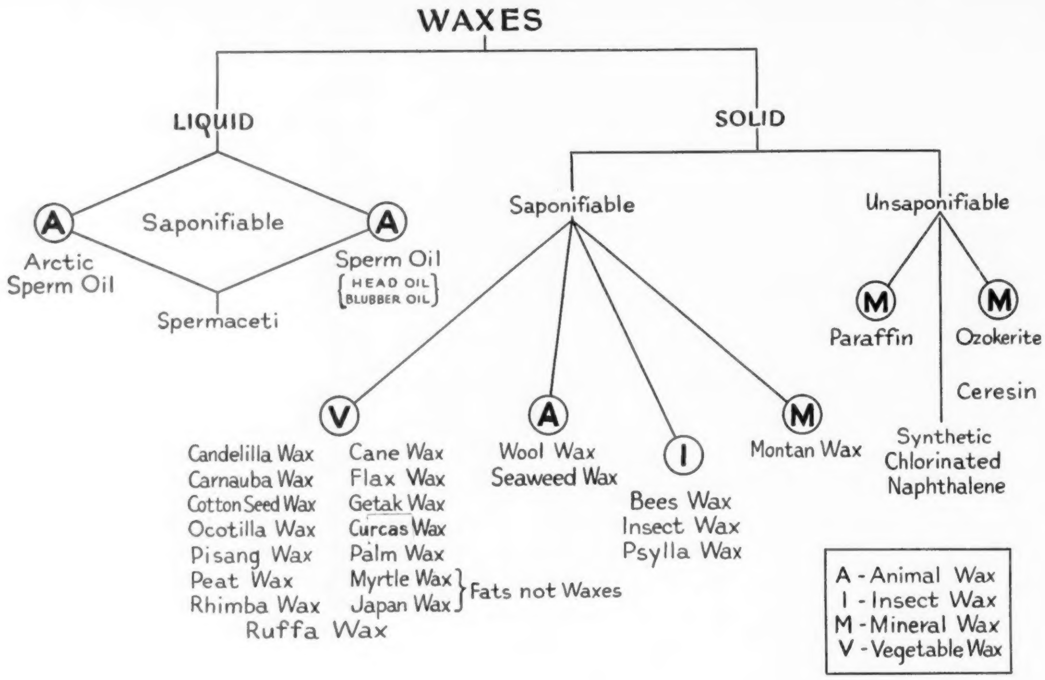
### By Ibert Mellan, M. Sc.

WAXES are widely distributed in the animal, vegetable and mineral kingdoms. The wax contributions of the mineral kingdom include the fossil waxes like ozokerite, paraffin waxes that are integral parts of petroleum, which are obtained by destructive distillation, and waxes that are constituents of peat, lignite, and brown coal, which may be obtained by solvent extraction, example montan wax. Waxes are generally found in the vegetable kingdom as coatings on leaves, stems, flowers, fruit, and seeds, a protective measure which nature employs against the elements. Sometimes waxes are even found in the tissues of these exposed parts of plants. The source of the waxes from the animal kingdom can be profitably compared with their existence in plants. Numerous animal waxes are secreted as protective coatings. An example is shellac, a mixture of resin and wax, secreted by the shellac insect. The bee, too, secretes an exudate called beeswax out of which it builds the structure of the honeycomb, while the parasitic insect *Coccus ceriferus* secretes a deposit called Chinese insect wax.

Most waxes resemble the fats very closely in many

**Wax Type Acids and Higher Wax Type Alcohols**

| *Name* | *Formula* | *Melting Point* | *Specific Gravity at 15°C.* | *Soluble in* | *Occurrence* |
|---|---|---|---|---|---|
| Cerotic Acid ................ | $CH_3[CH_2]_{24}CO.OH$ | 77.8°C. | .836 at 79°C. | Warm Alcohol | Free in beeswax, montan wax, carnauba, also as cerotate in insect wax, wool wax, and carnauba. |
| Montanic Acid .............. | $CH_3[CH_2]_{26}CO.OH$ | 83°C. | ......... | Methyl Alcohol | Free in montan wax. |
| Melissic Acid ............... | $CH_3[CH_2]_{28}CO.OH$ | 91°C | ......... | ........ | Free in beeswax and montan wax. |
| Stearic Acid ................ | $CH_3[CH_2]_{16}COOH$ | 70.5°C. | .847 | Alcohol Ether | .............................. |
| Palmitic Acid ............... | $C_{16}H_{32}O_2$ | 62.2°C. | .846 | Alcohol Ether | As tri-palmitin in palm oil and Japan wax; as cetyl palmitate in spermaceti; as myricyl palmitate in beeswax. |
| Lauric Acid .................. | $C_{12}H_{24}O_2$ | 43.5°C. | ......... | ........ | As laurin in cocoanut oil and Japan wax. |
| Myristic Acid ............... | $C_{14}H_{28}O_2$ | 53.8°C. | ......... | ........ | As myristin in coconut and palm-nut oils. |
| Cetyl Alcohol ............... | $C_{16}H_{33}OH$ | 50°C. | .810 | Alcohol Ether Benzol | As cetyl palmitate in spermaceti. |
| Octodecyl Alcohol ........... | $C_{18}H_{37}OH$ | 59°C. | ......... | ........ | Spermaceti. |
| Ceryl Alcohol ............... | $C_{26}H_{53}OH$ $C_{27}H_{55}OH$ | 79°C. | ......... | Alcohol Ether | As ceryl palmitate in opium wax, as ceryl cerate in Chinese insect wax. |
| Myricyl Alcohol ............ | $C_{30}H_{62}(OH)_2$ | 88°C. | ......... | Alcohol Ether | As myricyl palmitate in beeswax, carnauba, sugar cane wax. |
| Anonymous Alcohol .......... | $C_{24}H_{48}(OH)_2$ | 103°C. | ......... | ........ | Carnauba wax. |
| Cocceryl Alcohol ............ | $C_{30}H_{60}(OH)_2$ | 103°C. | ......... | ........ | Cochineol wax. |
| Cholesterol or Cholesteryl Alcohol ......... | $C_{26}H_{43}OH$ | 147°C. | ......... | Ether Benzol | In wool-fat and sperm oil. |
| Iso-Cholesterol (Isomeric) .... | .................. | 137 to 138°C. | ......... | ........ | .............................. |
| Phytosterol ................. | .................. | 134°C. | ......... | ........ | Plant cholesterol. |




*Common waxes grouped according to their physical state and also as to their saponification properties.*

of their properties, but differ in their chemical make-up. Fats are glycerol esters of higher fatty acids while true waxes are esters of mono- or di-hydric alcohols with higher fatty acids. In addition to these esters there are present some hydrocarbons with 30-60 carbon atoms, alcohols of the phytosterol series, and aliphatic alcohols [straight chain compounds] of the ceryl alcohol type. The combined and free acids belong to the oleic acid group. Upon the treatment of a wax with strong bases the esters are broken up into their component parts. Spermaceti, which consists mainly of cetyl palmitate, is split up into palmitic acid and cetyl alcohol upon treatment with potassium hydroxide.

$$\underset{\text{Cetyl palmitate}}{C_{15}H_{31}.COO\,\boxed{C_{16}H_{33} + K}}\,\underset{\text{Potassium hydroxide}}{OH} \longrightarrow$$

$$\underset{\text{Potassium palmitate}}{C_{15}H_{31}COOK} + \underset{\text{Cetyl alcohol}}{C_{16}H_{33}OH}$$

Ad. Grüm has synthesized secondary wax alcohols [Z. Angew. Chem. 39, 421-8, 1037, 1926] by heating ketones with ethyl alcohol in molecular proportions in the presence of sodium hydroxide at 300° C. for 6-8 hours. He prepared the following wax alcohols:

Pentatricontanol $[C_{17}H_{35}]_2CHOH$
Hentriacontanol $[C_{15}H_{31}]_2CHOH$
Heptaconsanol $[C_{13}H_{27}]_2CHOH$
Tricosanol $[C_{11}H_{23}]_2CHOH$

From the above he prepared sixteen wax esters.

Of all the physical characteristics of waxes, the melting point is the most important figure. Thus, in the manufacture of polishes for floor, furniture and shoe, the brilliancy of the polish is generally proportional to the hardness of the wax or wax mixture and consequently to its melting point. It does not follow that two waxes of the same melting point have equal polishing value. For example, paraffin wax of 45° C. melting point will not produce the same polishing effect as myrtle wax with the same melting point. It is claimed by some that hard waxes contain added rosin to raise the melting point; however, this substance has little polishing value.

Our knowledge of beeswax antedates that of all other waxes by many centuries. The ancient Egyptians made figures of their deities out of beeswax. These were placed in their graves and have come down to us in a more or less preserved state. Also, beeswax is collected more widely than any other wax. It is obtained from the honeycombs by boiling in water, or may be expressed and then the residue extracted with a solvent. The wax is then refined and bleached. The color varies from light yellow to dark greenish brown and the bleached, of course, is white. It has a sweetish odor and is fairly brittle, but plastic, when warm. Beeswax is principally myricyl palmitate $C_{30}H_{61}.C_{16}H_{31}O_2$ with cerotic acid and small quantities of free alcohols such as myricyl and ceryl alcohol, free melissic acid, and 12-14% hydrocarbons. Gascard and Damory [Compt. rend. 177, 1222-4, 1442-3 (1923)] have isolated the following acids, alcohols and hydrocarbons:

| | *Melting Point* |
|---|---|
| Neocerotic acid $C_{25}H_{50}O_2$ | 77.8°C. |
| Cerotic acid $C_{27}H_{54}O_2$ | 82.5°C. |
| Montanic acid $C_{29}H_{58}O_2$ | 86.8°C. |
| Melissic acid $C_{31}H_{62}O_2$ | 90.0°C. |
| Neoceryl alcohol $C_{25}H_{52}O$ | 75.5°C. |
| Ceryl alcohol $C_{27}H_{56}O$ | 80.0°C. |
| Montanyl alcohol $C_{29}H_{60}O$ | 84.0°C. |
| Myricyl alcohol $C_{31}H_{64}O$ | 87.0°C. |
| Pentacosane hydrocarbon | 54.0°C. |
| Heptacosane hydrocarbon | 59.6°C. |
| Nonacosane hydrocarbon | 63.0°C. |
| Hentriacontane hydrocarbon | 68.5°C. |

## Physical and Chemical Properties of the Common Waxes

| | *Sp. Gr.* | *Ref. Ind.* | *M.P. °C.* | *Setting Point* | *Sap. No.* | *Unsap. Matter %* | *Iodine Val.* | *Bromine Thermal Test* | *Acid Val.* | *Fatty Acid %* | *Ratio No.* | *Acetyl Val.* | *Alcohols and Hydrocarbons* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bayberry (Myrtlewax) Not a true wax ..... | .993–.997 | .......... | 41 | ..... | 206–216 | ..... | 2.0–4.0 | .2–.6 | ....... | ...... | .68 | .. | ....... |
| Beeswax .............. | .960–.974 | 1.440/75° | 62–66 | 60–63 | 90–101 | 55.5 | 7.5–12.0 | 1.3–2.0 | 20 | 47.8 | 3.6–3.8 | .. | 52–56% |
| Cane Sugar Wax ..... | .980 | .......... | 58 | ..... | 80–90 | 69.0 | 88 | ...... | 12 | 33.3 | 5.7 | .. | ....... |
| Candelilla Wax ....... | .972 | 1.456/75° | 66–70 | 63–68 | 50–65 | 74.0 | 35 | ...... | 10–20 | 29.0 | 4.7 or 39 | .. | 65–75% |
| Carnauba Wax ........ | .992–.998 | 1.472/43° | 83–84 | 80–87 | 67–88 | 55 | 12.5–15.0 | 1.7–2.4 | 2.5 | 48.0 | 31 | 50 | 54–55% |
| Chinese Insect Wax ... | .932–.970 | .......... | 81–83.5 | 80–81 | 82–93 | 49.5 | 0–1.5 | 0–.2 | 3 | 51.5 | 29.3 | .. | 49–50% |
| Cotton Seed Wax ..... | ....... | .......... | ..... | ..... | 150–160 | ..... | 11–13 | ...... | ....... | ...... | ...... | .. | Ca 50% |
| Flax Seed Wax ....... | .908 | .......... | 62–70 | ..... | 100–150 | ..... | 9–17 | ...... | 54.5 | ...... | ...... | .. | 81.3% |
| Palm Wax .......... | ....... | .......... | ..... | ..... | ....... | ..... | ........ | ...... | ....... | ...... | ...... | .. | ....... |
| Montan Wax ......... | ........ | .......... | 73–84 | 70–80<br>74-127 | 30–45 | ..... | 10–15<br>16–20 | ...... | 15–20<br>73–83<br>(Dist.) | 11–15<br>56–64<br>(Dist.) | 3–3.5<br>.03<br>(Dist.) | .. | Ca 80% |
| Paraffin Wax Not a true wax ..... | .870–.910 | 1.4331–1.4450 | 26–56<br>35–75 | ..... | 0–1.3 | 100 | 0 | ...... | 0 | 0 | 0 | .. | Ca 5% |
| Ozokerite Ceresin Wax ........ | .913–.923 | 1.4415–1.4464 | 59–76 | 76 | 1.3 | 100 | 0 | ...... | 0 | 0 | 0 | .. | ....... |
| Japan Wax Not a true wax ..... | .976–.993 | 1.4518 | 52-59 | ..... | 219–237 | .7–15 | 5.0–16.0 | .6–2.6 | 6–20 | 90 | 11–35 | .. | ....... |
| Raphia Palm Wax .... | ........ | .......... | 82.0 | ..... | ....... | ..... | ........ | ...... | ....... | ...... | ...... | .. | ....... |
| Sperm Whale Oil: Head Oil .......... | .879 | 1.459 | 12 | ..... | 66–76 | 40 | 86–91 | 14.3–15 | 1.5 | ...... | ...... | 5 | 39–43% |
| Body Oil .......... | .876 | 1.462/25° | ..... | ..... | 88–93 | ..... | ........ | ...... | ....... | ...... | ...... | .. | 33–44% |
| Arctic Sperm Oil ...... | .878 | 1.456/25° | 9 | ..... | 77–79 | ..... | ........ | ...... | ....... | ...... | ...... | .. | ....... |
| Spermaceti ............ | .933–.963 | 1.4198 | 41–59 | ..... | 122–134 | 51.5 | 3.0–4.0 | .5–30 | 0.5–1.0 | 53.5 | 124–<br>very high | .. | ....... |
| Wool Wax ........... | .945 | 1.480 | 37–41 | ..... | 101–104 | ..... | 25–43 | 3–4.6 | 12.2<br>50% | ...... | ...... | 23 | ....... |

### Adulterants

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hardened Oil ......... | ........ | .......... | 30–60 | ..... | 198 | .5–2.0 | 10 | ...... | Variable | 95 | 25–200 | .. | ....... |
| Rosin ................ | 1.07–1.08 | .......... | over 100 | ..... | 147–180 | 5–15 | 55–180 | ...... | 130–186 | ...... | .1–0.2<br>\|18-19\| | .. | ....... |
| Stearin .............. | ........ | 1.4380 | 49–56 | ..... | 200 | 0.5 | .5–30 | ...... | .98 | 96–99.5 | .01 | .. | ....... |

## Solubility Data on the Common Waxes

| | *Solubility in Alcohol* | *Solubility Hot Acetic Anhydride* | *Solubility in Acetone* | *Solubility in Chloroform* | *Solubility in Ether* | *Solubility in Petroleum Ether* | *Solubility in Turpentine* | *Solubility in Carbon Tetrachloride* | *Solubility in Fusel Oil* |
|---|---|---|---|---|---|---|---|---|---|
| Bayberry ... | .......... | .............. | .............. | ............ | ............ | ............ | ....... | ....... | ....... |
| Beeswax ... | 76°C. | Melts, floats, dissolves–solidifies on cooling | Insoluble in cold Soluble in hot | Cold—insoluble Hot—soluble | Soluble in hot and cold | Insoluble | Soluble | Soluble | Soluble |
| Candelilla .. | 63°C. | .............. | .............. | ............ | ............ | ............ | ....... | ....... | ....... |
| Carnauba .. | 82°C. | Becomes acetylated | Insoluble in cold not very soluble in hot | Cold—insoluble Hot—soluble | Cold—insoluble Hot—soluble | Cold—insoluble Hot—soluble | Soluble | Soluble | Soluble |
| Ceresin .... | Insoluble | .............. | .............. | ............ | ............ | ............ | ....... | ....... | ....... |
| Chinese Insect Wax | Insoluble | .............. | .............. | ............ | ............ | ............ | ....... | ....... | ....... |
| Japan Wax .. | 76°C. | Dissolves and solidifies on cooling | Insoluble in hot and cold | Soluble in cold and hot | Soluble in cold and hot | Soluble | Soluble | Soluble | Soluble |
| Montan .... | Dist. Montan Wax 70°C. | .............. | .............. | ............ | ............ | ............ | ....... | ....... | ....... |
| Ozokerite .. | .......... | Dissolves and solidifies on cooling | .............. | ............ | ............ | ............ | ....... | ....... | ....... |
| Paraffin .... | Insoluble | .............. | Insoluble in cold and slightly soluble in hot | Soluble in cold and hot | Soluble in hot and cold | Soluble | Soluble | Soluble | Soluble |
| Spermaceti . | 44°C. | .............. | Insoluble in cold and soluble in hot | Soluble in cold and hot | Soluble in hot and cold | Soluble | Soluble | Soluble | Soluble |
| Sperm Oil .. | .......... | .............. | .............. | ............ | ............ | ............ | ....... | ....... | ....... |
| Wool Wax . | .......... | .............. | .............. | ............ | ............ | ............ | ....... | ....... | ....... |
| Stearin .... | .......... | .............. | .............. | ............ | ............ | ............ | ....... | ....... | ....... |

Boyen [Brit. Pat. 209,064 (1923)] prepared waxes resembling beeswax by heating mineral, animal, or vegetable hard waxes with a drying oil and a drying agent such as litharge. The lead may be removed with acids and the compound bleached. Brit. Pat. 209,065 (1923) deals with the making of a kneadable wax substitute by mixing wool grease with a hard wax such as montan, carnauba, candelilla, or Chinese insect wax and then oxidizing the mixture with nitric acid at about 130° C.

Rabinovich and Kormer [Vestnik, Kozkevenoi Prom. i Torgov 1931, 47-9] raised the melting point of beeswax by heating it with litharge and red lead at 225° C. for one-half hour. The resulting product was darker in color, harder in consistency, and its melting point was 78° C. It was found to be satisfactory for finishing purposes in leather manufacture.

Due to the price and widespread use of beeswax, it is adulterated with many substances, such as stearic acid, paraffin, Japan wax, tallow, rosin, ceresin, and other waxes.

### Chinese Insect Wax ["vegetable spermaceti"]

This wax is a secreted deposit of a parasitic insect [*coccus ceriferus* and others] found on certain trees in Western China. It is crystalline, white to pale white in color, and resembles spermaceti but has a more fibrous structure. The bulk of the wax is ceryl cerotate [$C_{25}H_{51}COO.C_{26}H_{53}$] or [$C_{27}H_{55}.C_{27}H_{53}O_2$]. Other substances found in the wax in smaller amounts are melissyl cerotate, acids like stearic, oleic, myristic, palmitic, arachidic, dihydrolaganic, cerotic [$C_{26}H_{52}O_2$], ibotacerotic [$C_{27}H_{54}O_2$], and hydrocarbons. These have been identified by R. Koyama (J. Chem. Soc. Japan, 54, 1233-7 (1933) and 55, 348-52 (1934)). The wax is obtained by placing the larvae of these insects on certain selected trees and as it goes through its life cycle, it secretes the wax on the branches and twigs. Most of the wax is removed by hand and the residue is removed by boiling the twigs and branches in water.

Psylla wax is a substance secreted from *Psylla alvi*, an aphid living on the leaves of *Ulnus incans*.

Carnauba wax is a hard yellowish-green or light yellow material with an agreeable odor of new mown hay. It appears on the market in lumps in three grades, No. 1 yellow, No. 2 yellow and North Country, and No. 3 chalky. It is found as a white powdery exudated mass on the leaves of a Brazilian wax palm [*corypha cereifera*]. This wax is removed from the cut sun-dried leaves by scrapping and is refined by melting in boiling water. Sometimes it is whitened by bleaching. Chemically it consists mostly of an ester composed of two molecules of fatty acid with one molecule of dihydric alcohol [a glycol—$C_{25}H_{50}(OH)_2$] and is myricyl cerotate $\begin{matrix} CH_3[CH_2]_{24}COO \\ CH_3[CH_2]_{24}COO \end{matrix}\!\!>\!C_{25}H_{50}$. There are also smaller amounts of esters of ceryl alcohol, myricyl alcohol, a dihydric alcohol [$C_{25}H_{52}O_2$ M.P. 103.5° C.], carnaubic acid, and a hydroxy-acid $C_{19}H_{38}\begin{matrix} \diagdown CH_2OH \\ COOH \end{matrix}$. A hydrocarbon of M.P. 50° C. is also present. Lewkowitsch is of the opinion that free cerotic acid is present. Due to its hardness and high melting point carnauba wax will take on a fine hard gloss. This property is an important criterion of its purity. Its high market price is an inducement to adulteration. Hence we often find carnauba wax contaminated with paraffin, ceresin, stearic acid, Japan wax, etc. Carnauba wax is used as a valuable ingredient in floor waxes, polishing paste, shoe and furniture polish, lacquers, varnish, carbon paper coatings, and to raise the melting points of soft waxes and candles, for leather finishes, electrical insulation compositions, waterproofing textiles and wood, and in phonographic records.

### Candelilla Wax

Candelilla wax is a brownish to greenish, brittle substance. It is not as hard as carnauba, neither has it as high a melting point, nor does it take on as fine a polish. However, it is employed as a substitute for it in shoe polish and finds application in some industries. It occurs as a coating on the stem of a leafless plant [*Pedilanthus pavanis*] growing chiefly in Mexico and is obtained either by boiling the stem in water or by extraction with petroleum ether. Its chemical composition is not fully known, but it consists mainly of a hydrocarbon hentriacontane [$C_{30}H_{62}$ or $C_{32}H_{66}$] together with lesser amounts of wax esters.

Some of the lesser known waxes about which we have little information are:

Cane sugar wax, found as a powdery substance on the surface of sugar cane and removed with hot water.

It resembles carnauba wax in appearance, melting point, and hardness. It can be employed for the same industrial purposes. [J. Soc. Chem. Ind. 41, 372 T (1922) and S. African J. Ind. 5, 513-8 (1922)].

Getak or gandang wax is obtained from a wild fig tree of Java. It is separated from the latex by boiling with water. It is said to contain ficoceryl alcohol and seems to be a transition product between rubber and wax. It is yellowish white in color but turns brown on exposure. Pisang wax is found on the leaves of *Tera Musal* in Java. Palm wax is an exudate from the palm trees of South America. Madagascar Rhimba wax is obtained from the Rhimba tree. Raphia or Ruffa wax is gotten from the leaves of a palm tree in Madagascar. Curcas wax is obtained from the bark of the *Jatrapha Curcas*. Peat wax is obtained by the extraction of peat with alcohol (Z. Angew Chem. 27, 1141-43). Flax wax is found as a coating on the flax fibre and is extracted with solvents. It varies in color from white to yellow-green to yellow-brown. Seaweed wax has been obtained from deposits of dead and decayed algae and is said to contain wax esters of higher saturated alcohols and fatty acids of licosanic, docosanic and tetracosanic series [$C_{20}$, $C_{22}$ and $C_{24}$].

Wool wax is pale, translucently yellow, neutral and unctuous in consistency. Its true chemical composition is not fully known, though it consists mainly of a mixture of neutral esters of the lanocerin type and free alcohols of the cholesterol and isocholesterol types. It is found in the natural grease from the fleeces of sheep. The grease is removed by treatment with weak soap, or sodium carbonate solution, or volatile solvents. The removed grease contains, besides the fatty acids of the soap employed in scouring, cholesterol, isocholesterol, esters of palmitic and myristic acids, other waxy substances, nitrogenous matter, potash salts and mineral oil.

### Montan Wax [Bitumen Wax]

Montan wax occurs in peat, brown coal, bituminous shale, and lignite and is extracted with benzine, petroleum ether or similar solvents. It has a high but variable melting point depending upon the source. That obtained from lignite is termed crude montan wax and is brownish to black in color, hard, brittle and fibrous in structure. Its chemical composition also varies with its source, but invariably it seems to contain esters of montanic acid $C_{28}H_{55}COOH$ and hydrocarbons.

Waxes of higher melting point are made by refining the crude or by oxidation or esterification of montanic acid contained in montan wax. These vary in color from brown to white and resemble ceresin wax. One type is made by heating montan wax with hydroxylated condensation products [Ger. Pat. 543,612 (1928)]. U. S. Patent 1,834,865 deals with the oxidation of montan wax in a liquid state by passing air through it at 160°-180° C. A pale, colorless, soft waxy material is obtained by heating montan wax and oxalic acid and passing air through it at 120°-220° C. [U. S. Pat. 1,834,866].

A substitute for beeswax is made by chlorinating montan wax in an aqueous solution by the action of chlorine gas in the presence of sodium hydroxide or calcium hydroxide. This product can be used in floor, shoe and other polishes. German Patent 565,734 (1934) deals with making a wax-like product by esterifying montan wax with methyl alcohol, then reducing the acid group by hydrogenation at 180°-200° C. in the presence of nickel kieselguhr catalyst. The esterification and hydrogenation cause the reduction of the saponification from 162 to 80 and the melting point is raised to 85° C.

Wax for shoe and floor polishing compounds [Brit. Pat. 324,631 (1928)] is obtained by esterifying bleached montan wax and fatty aromatic or hydroaromatic acids such as coconut oil fatty acids, benzoic, salicylic acids, wool-grease by means of a polyhydric alcohol such as ethylene glycol, or polyglycols, or glycerol in the presence of a catalyst like sulfuric or hydrochloric acid. A wax substance for carnauba in polishing creams for shoes, floors, etc. [Fr. Pat. 644,149 (1927)] is made by oxidation of montan wax with acids other than nitric acid, particularly chromic acid in the presence of glacial acetic acid.

Synthetic waxes [Ger. Pat. 550,324 (1928)] are made by mixing wax acids contained in montan wax with oils, fats, resins, etc., containing other organic acids. These are then esterified with polyhydric alcohols.

Synthetic waxes [Brit. Pat. 356,731 (1930)] are obtained by hydrogenating aliphatic or cycloaliphatic acids containing more than 5 carbon atoms in the presence of an activated catalyst like [Cu, Ni, Fe, Co, Ag, etc.]. Then the alcohols and esters formed are esterified with montanic acid or the like.

W. Pungs & M. Jahrstrofer [Can. Pat. 284,971 (1928)] harden solids and semi-solids of low melting point such as hydrocarbons, esters, fatty acids and their glycerides, or alcohols such as occur in paraffin, ozokerite, ceresin, stearin, tallow and raise their melting points by the addition [up to 10%] of montan wax bleached with chromic acid. Crude or refined montan is heated [Ger. Pat. 540,361 (1928)] with resinous or vitreous hydroxylated condensation products, preferably with the exclusion of oxygen until esterification occurs. Accelerators may be added. Suitable condensation products are resins of the phenol-formaldehyde or urea-formaldehyde type, or initial condensation products may be used. 70 parts bleached montan wax and 30 parts of ortho-cresol-formaldehyde condensation products are treated with sodium hydrogen sulfate one part. The mixture is heated to 240° C. for ten hours in the presence of carbon dioxide. The product is both resinous and waxy. The melting point and hardness may be raised by converting the wax acid into a metal salt.

Waxes [Fr. Pat. 717,413 (1931)] can be made by treating crude deresinified lignite wax to reduce the fatty acids to alcohols. Then these alcohols are esterified with organic acids such as palmitic acid or acids obtained from lignite wax. The esterification may take place in the presence of other mono-poly-hydric alcohols or other [OH] containing compounds.

### Mineral Waxes

Sakhanov and Zherdeva are of the opinion that ceresins and paraffin waxes belong to the methane hydrocarbons. Ceresins, contrary to paraffins, produce stable mixtures with oil which cannot be separated by filtration or sweating. Ceresins can be distilled without decomposition under reduced pressure. Ceresins differ from paraffins by higher molecular weight, viscosity, and boiling point. Chemically they are distinguished by the ease with which they are attacked by fuming sulfuric acid. They are of the opinion that possibly they belong to the isoparaffin series.

Paraffin waxes are mixtures of saturated hydrocarbons of the $C_nH_{2n+2}$ series. They are non-saponifiable and are therefore not true waxes. These are white to bluish white in color, translucent, waxy,

lamino-crystalline, and are non-reactive with most chemicals. The melting points range from 35°-75° C. and the specific gravities vary from .823 to .940. Paraffin waxes are obtained from the destructive distillation of petroleum oil. Chemically they are hydrocarbons and are mixtures of the following:

| | *Formula* | *Melting Point* |
|---|---|---|
| Tricosane | $C_{23}H_{48}$ | 48°C. |
| Tetracosane | $C_{24}H_{50}$ | 50°–51°C. |
| Pentacosane | $C_{25}H_{52}$ | 53°–54°C. |
| Hexacosane | $C_{26}H_{54}$ | 55°–56°C. |
| Octocosane | $C_{28}H_{58}$ | 60°C. |
| Nonocosane | $C_{29}H_{60}$ | 62°–53°C. |

They are soluble in mineral oil, ether, and benzine. Their value is proportional to their melting point.

Ozokerite is found as a native fossil wax in Galicia and Utah. Some think it is an intermediate product between natural fat and petroleum. Just as it varies from translucent yellow to greenish brown to opaque black in color, its specific gravity, too, varies from .85 to .95 and so does its degree of hardness vary from soft to hard. Ozokerites differ from paraffin wax in being non-crystalline and plastic when heated. They are soluble in nearly all of the oil solvents. Refined ozokerite is known as ceresin and ranges from yellow to white in color. The bleached types resemble and are used as substitutes for beeswax. Their melting points vary from 61° to 70° C. and have the general properties of paraffin wax. They are soluble in benzol, petroleum ether, gasoline, carbon tetrachloride, nearly insoluble in cold alcohol, soluble in boiling absolute alcohol from which they will separate on cooling. They are adulterated with paraffin and rosin, the former lowers the melting point while the latter raises it.

### Liquid Wax

Sperm oil is not a fatty oil but a liquid wax obtained from the head and blubber of the sperm whale. It is pale yellow to light brown in color and odorless to fishy in odor. It is not definitely known whether the oil consists principally of "dodecotyl oleate" [$C_{12}H_{25}.C_{18}H_{30}O_2$, an ester of a monohydric alcohol of a fatty acid of oleic series] or "cetyl physetoleate" [$C_{16}H_{33}.C_{16}H_{29}O_2$]. In addition it contains spermaceti wax and higher alcoholic bodies. From the head oil has been isolated cetyl alcohol 50%, unsaturated alcohol [$C_{16}H_{31}(OH)$] 10-12%, a saturated alcohol octadecyl alcohol [$C_{18}H_{37}OH$] 25%, some acids and other alcohols. The blubber oil contains cetyl and hexadecenyl alcohol 20% and octadecyl alcohol 5%. The arctic sperm oil closely simulates sperm oil. Grades of sperm oil on the market are at times adulterated with whale, seal oil, mineral oil, and fatty oils.

Spermaceti is a solid wax precipitate from the sperm oil obtained from the head and blubber of the sperm whale. It occurs as glistening pearly white masses with crystalline structure and is very brittle in con-

**Properties of Basic Halowax Products**

| | *Halowax Oil No.* 1000 | *Halowax No.* 1012 | *Halowax No.* 1013 | *Halowax No.* 1014 |
|---|---|---|---|---|
| Description (Room Temperature—68°F.) | Liquid | Hard Crystalline Solid | Hard Semi-Amorphous Solid | Tough Amorphous Solid |
| Color | Water White | White to Pale Yellow | Pale Yellow | Pale Yellow |
| Flow Point (ASTM—Ball & Modified Ring °F.) | ............ | 196–205 | 239–249 | 270–280 |
| Specific Gravity (68°F./68°F.) | 1.19–1.25 | 1.53–1.59 | 1.65–1.71 | 1.75–1.81 |
| Boiling Range (ASTM—°F.) | 480–540 | 600–650 | 625–675 | 680–730 |
| Flash Point °F. | 203 | 284 | 356 | 392 |
| Fire Point °F. | 338 | None | None | None |
| Viscosity (Seconds, Saybolt at indicated temperature) | 29 sec.at 212°F. | 35 sec. at 212°F. | 33 sec. at 266°F. | 35 sec. at 302°F. |
| Maximum Acidity (Milligrams of KOH per gram Halowax) | 0.1 | 0.1 | 0.1 | 0.1 |
| Penetration (200 gram load—5 sec. at 77°F.) | ............ | 10–15 | 8–10 | 5–8 |
| Volatility (Gram/sq. in./hour at 221°F.) | 0.13 | 0.01 | 0.004 | 0.001 |
| Frost Point (ASTM) °F. | 36 | .................. | ...................... | ................ |
| Coefficient of Lineal Expansion in./in. °C.: | | | | |
| Liquid | .00021 | .00013 | .00012 | .00011 |
| Solid | ............ | .000082 | .000064 | .000049 |
| Coefficient of Cubical Expansion cu. in./cu. in. °C.: | | | | |
| Liquid | .00060 | .00049 | .00026 | .00024 |
| Solid | ............ | .00027 | .00018 | .00010 |
| Vapor Pressure—130°F. | 1.0–2.0 | 0.2–0.4 | 0.1–0.2 | 0.1–0.2 |
| Index of Refraction (D Line) at 77°F. | 1.6335 | .................. | ...................... | ................ |

Crude products with properties similar to the above products but dark in color are available.
All products are readily soluble in common hydrocarbon solvents.
They are also resistant to alkalies and acids except those that are strong oxidizers.
The temperature range between the liquid and solid state is very small.
Special products for special applications.
No. 1012 is tri and tetrachlornaphthalene.
No. 1013 is tetra and pentachlornaphthalene.
No. 1014 is penta and hexachlornaphthalene.

sistency. Chemically it is cetin [cetyl palmitate $C_{16}H_{33}.C_{16}H_{33}O_2$].

### Fat-Like Waxes

Japan wax and myrtle wax are misnamed. They are true fats yielding glycerin when saponified. Myrtle or Bayberry wax is a vegetable fat obtained by boiling out the berries of *Myrica cerifera*, a tree found in Maryland, Florida, and Texas. It is light green in color, fairly hard and brittle, with a melting point of 40-44° C. Its constituent parts are palmitin, laurin, and myristin. Japan wax is a vegetable fat obtained from the berries of the various species of the Japanese sumac. It is colored pale yellow to light brown, with a pronounced characteristic odor and is fairly hard and brittle. Chemically it consists chiefly of palmitin [propenyl palmitate $C_3H_5(C_{16}H_{31}O_2)_3$], free palmitic acid and a little of a dibasic acid (Japanic acid), laurin, stearin. On saponification this so-called wax yields glycerin.

In the category of synthetic waxes we find one type that is actually made synthetically, that is made from simpler substance and unrelated to waxes chemically, and another type that is classified as synthetic but in reality is a waxy substance whose properties have been altered by oxidation, reduction, esterification, saponification, etc. Thus J. Bear [Brit. Pat. 300,200 (1927) and Ger. Pat. 530,734 (1928)] makes a waxy substance by reacting methylene or ethylene dichloride with a dilute ammonium mono-sulfide solution. Another type of wax-like substance is made by the chlorination of naphthalene with the aid of heat, pressure, and a catalyst. Brit. Pat. 406,355 (1934) deals with the making of a wax-like product by melting together chlorinated naphthalene and a resin oil.

The altered type of synthetic resin consists mainly of esterified montanyl alcohol or montanic acid. A brief outline of their development, properties and uses can be consulted in Rev. Gin. Mat. Plastique 7, 653-7 (1931); Tila 9, 1161-5.

W. Pungs and H. Freytag [U. S. Pats. 1,972,459 and 1,942,833] make a synthetic wax by the esterification of crude montan wax with ethyl alcohol in the presence of concentrated sulfuric acid. In place of ethyl alcohol can be used 1.2 propylene glycol, 1.3 butylene glycol, or glycerol. Brit. Pat. 327,162 (1930) deals with esterification of montan wax with castor oil or ricinoleic acid in the presence of hydrogen chloride gas.

**Synthetic Mineral Waxes**

Made by Mitchell-Rand Mfg. Co.

| | *No.* 2961 | *No.* 2962 | *No.* 2981 | *No.* 2973 *Ozokerite Substitute* |
|---|---|---|---|---|
| Melting point, U. T. D. | 189°F. | 176°F. | 195°F. | 171°F. |
| Specific gravity at 60°F. | 1.0075 | 0.9803 | 0.9956 | 0.9565 |
| Penetration: 32/200/60 | 0.0 | 0.0 | 0.0 | 0.0 |
| 77/100/5 | 0.5 | 0.5 | 0.0 | 3.0 |
| 115/50/5 | 1.0 | 2.5 | 0.5 | 5.5 |
| Color ............... | Brown-Black | Brown-Black | Brown-Black | Dense Black |

**Synthetic Vegetable Waxes**

| | *No.* 2990 | *No.* 2998 |
|---|---|---|
| Melting point, U. T. D. ................. | 167°F. | 173°F. |
| Specific gravity at 60°F. ................ | 0.9939 | 0.9610 |
| Penetration: 32/200/60 ................. | 0.0 | 0.0 |
| 77/100/5 ................ | 0.0 | 0.0 |
| 115/50/5 ................ | 0.0 | 0.0 |
| Color ................................ | Olive | Cream White |

**Synthetic Animal Waxes**

| | *No.* 2979 | *No.* 2975 | *No.* 2983 |
|---|---|---|---|
| Melting point, U. T. D. ...... | 171°F. | 163°F. | 149°F. |
| Specific gravity at 60°F. ..... | 0.9290 | 0.9234 | 0.9146 |
| Penetration: 32/200/60....... | 3.0 | 0.0 | 1.0 |
| 77/100/5 ....... | 9.0 | 6.0 | 25.0 |
| 115/50/5 ....... | 16.0 | 18.5 | |
| Color ..................... | Orange-yellow | Approx. natural beeswax | Approx. natural beeswax |

Compounds No. 2961, 2926 and 2981 are regarded as substitutes for genuine Montan wax.

Compounds No. 2990 and 2998 are designated as Carnauba substitutes.

Compounds No. 2979, 2975 and 2983 are designated as Beeswax substitutes.

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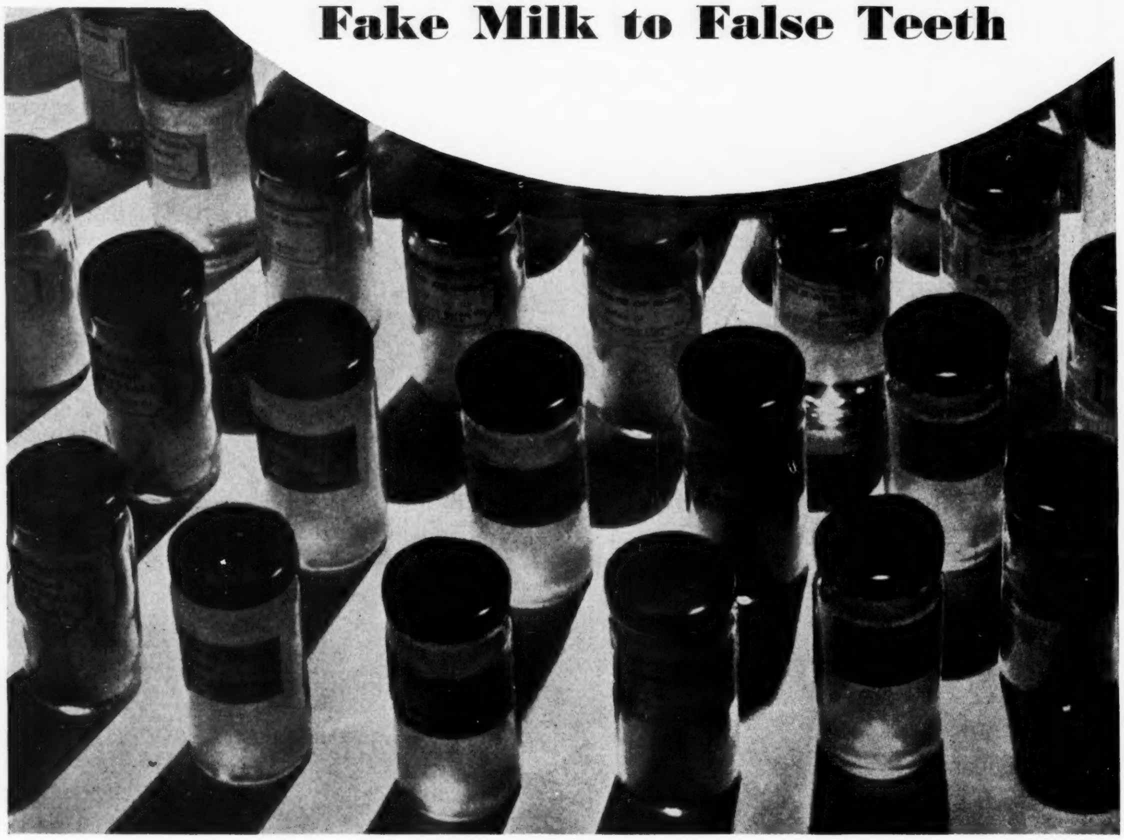
## Tungsten Salts in Tanning Compounds

Tungsten salts, under certain conditions of temperature, etc., decompose to give complexes. Prof. Dr. V. Casaburi and Prof. Dr. E. Simoncini, *Chemical Trade Journal*, London, have prepared some complexes of pure tungsten and some of its boron, silicon, phosphorus and sulfur derivatives, and all have the common property of precipitating albuminoids to give organo-metallic complexes. These compounds act as tanning agents towards hide substances. They penetrate pelt rapidly and give a good heavy leather. Chemical analysis and physical properties of leathers made by this method show a close relationship between tungsten-tanned and vegetable-tanned leather. The mordanting properties of the complex tungsten salts have also been investigated. Skins pickled with tungsten and chrome tanned, or tanned with chromium and mordanted with tungsten, fix basic colors quantitatively and in a very uniform manner.

# Fake Milk to False Teeth



## Some Drop - in - the - bucket Uses of Silicate of Soda

### *By Howard W. Elkinton*

The grand road from the mountain goes shining to the sea,
And there is traffic on it and many a horse and cart,
But the little roads of Cloonagh are dearer far to me
And the little roads of Cloonagh go rambling through my heart.

THIS quotation, introduced rather aptly in a solemn sales conference, illustrated exactly what each one was thinking—not the big uses of silicate of soda but the odd uses, the incidental applications, those practices that do not run into tonnage but amuse the Company when they come to official attention. Eva Gore-Booth had put her poetic finger on the fascination that some small things have in life.

So, disregarding tonnage talk for a few minutes, we began to check up. The young man who spends much time drawing designs for the Company's advertisements contributed the happy remark that his wife was somehow interested in silicate of soda and the theatre. He fished from a pocket, that shared commensurable accommodation for sketching pencils, erasers, matches and odd cash, a clipping that read as follows:

One of the problems confronting stage folk is how to look all wet. No gags, please. Just wet. In "Revenge with Music" which was based on Spain's "Three-Cornered Hat" folk tale, Charles Winninger solved the problem very neatly. As the aged Governor, he was supposed to fall into a mill pond. So Mr. Winninger, protected by a rubber union suit, fell into a tank of water.

At the Monte Carlo Ballet Russe performance of "The Three Cornered-Hat," David Lichine isn't so realistic. He falls behind some scenery and changes into another coat which is treated to look wet. I don't know what the treatment is (writes John Chapman in his Broadway Column in the *Evening Ledger*) but it may be similar to Harold Johnsrud's.

In "Winterset," Johnsrud has the role of a gangster who is shot and dumped into the East River, and who returns like Banquo to frighten his murderer. Johnsrud looks as wet as Winninger did, but he isn't. He has two suits, and the "wet" one has been daubed with sodium silicate—the water glass that is used to preserve eggs. Theodore Hecht, Johnsrud's dressing-room mate, says the stuff is being used to preserve a ham.

A merry laugh went up—in fact two laughs, one for the ingenious Johnsrud who had discovered the "wetting" value of silicate of soda and another for that versatile chemical.

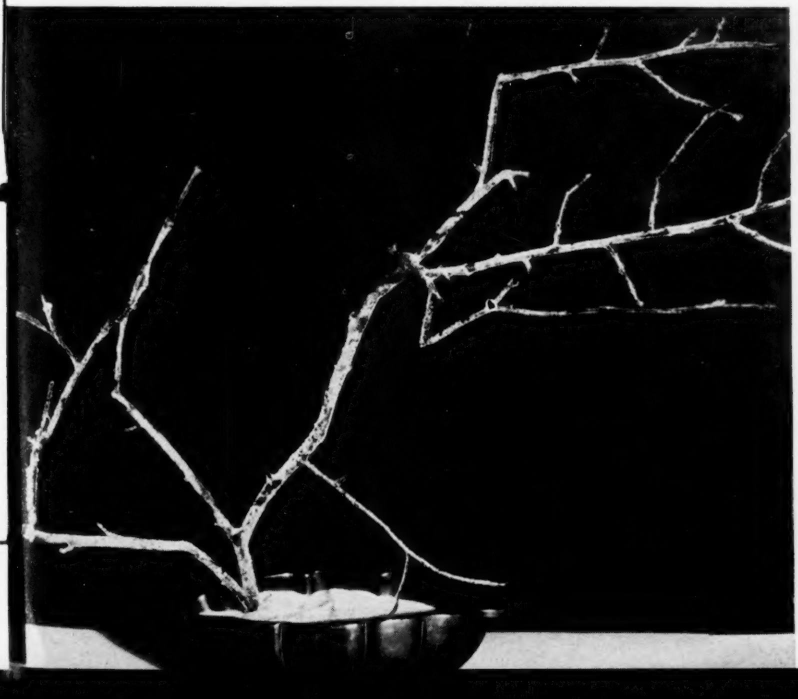
One yarn spun another. The stenographer who was on the switchboard, with her eyes and ears, had a little time to knit. She apparently had spied an application to textiles that greatly aided the weavers of coarse fabrics. A resourceful twinester made a practice of uniting the broken ends of twines merely by moistening the fingers with silicate and then twisting the fibers into a united thread. The silicate dries quickly and a good bond is had.

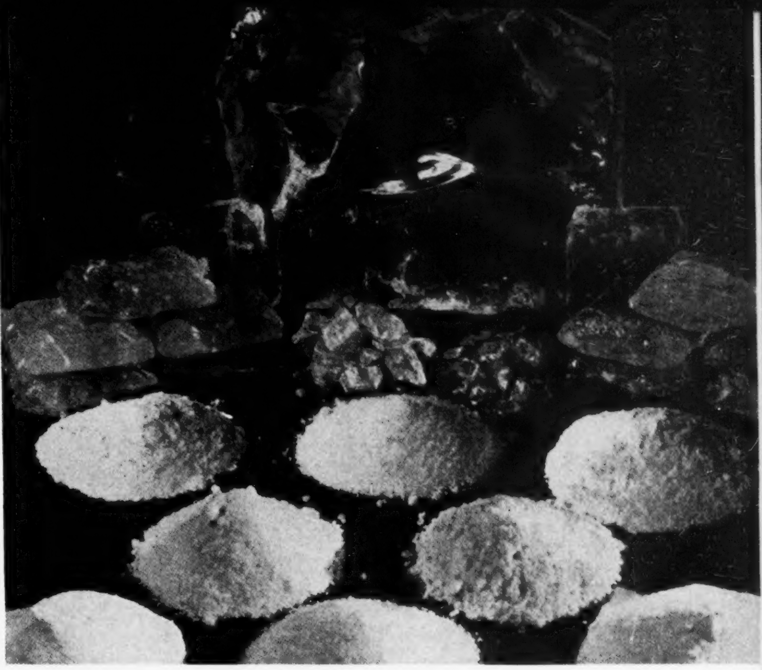
Fire spreads in dry grass, so the talk drifted to the proper grade of silicate of soda to be used for setting milady's hair. This is a new use and an idea that teased more than one member of the staff. The formula is a simple one: Six ounces of silicate in a gallon of water; add color to match the hair, and the formation was fixed. This quip was hard on credulity, but evidence was found in the serious suggestion by a well meaning beautician, so it could not be gainsaid. We all agreed that it might dazzle a one-time admirer or cement a broken love, but it would be tough on the comb and brush.

About that time a serious minded chemist roused from the reading of *Industrial and Engineering Chemistry*. Here we have it quoted solemnly so that every one would be duly impressed:

> A permanent etching might easily be obtained by writing the letters and numbers on glassware using water-glass and a steel pen. The results are satisfactory although this method of marking glassware is not commonly used.
>
> The article to be marked should be cleaned and thoroughly dried. Dip the pen in the sodium silicate solution 30%, drain the excess reagent from the pen point by touching the pen to the mouth of the reagent bottle, and mark the desired letters or numbers on the glass. Allow the markings to dry for a few minutes and then go over them with a second application. The markings are heated in the hottest point of the Bunsen flame or in a blast-lamp flame until the markings, which frost at first, turn red. The heating will take about one minute. The intensity of heating will depend on the pieces of apparatus and the kind of glass, but with more intense heating, a better etching is obtained. On cooling, the etching is a heavy white frosting, some of which will wear off, but there will remain a good permanent white etching which will not be removed by daily washing in acid, alkali, or soap. The heavy frosting appears to become still more permanent if allowed to stand a few days before being washed.

*A silicate frosted tree; the branch being treated with silicate of soda and common salt cast against the twigs.*





*Silicate of soda in lump and powder forms.*

"I thought so!" yawned a salesman who had never been awfully keen on chemistry, but had been at the Chicago Fair. "You know what those babies did for milk? They were up against it in the Electrical Building where they were demonstrating machinery for incorporating Vitamin D in milk. The demonstration required ten gallons of milk each day. Naturally, an exhibit running for two summers could not be expected to use real milk. They developed the perfect compound, a beautiful little deception thanks to silicate of soda and *my* genius. (Salesmen are invariably modest.) We compounded a soluble cutting oil with water and silicate, plus a bit of Metso Granular to aid flow. The solution was white enough to fool a cat. Further, it did not spoil, or sour, or turn to butter, or do any of those unsatisfactory things that milk will do. No curds, no germs, no cows! The milkman's dream!"

Again a chuckle crept through the office and drew, from one who is fond of a good cigar, a curious tale of a cigar manufacturer who wished to ape the long ash retained by a Blackstone. He guessed that silicate could help the ash retention, so he soaked the inside wrapper in silicate, covered it up with an outside leaf, and presto! an inexpensive smoke that held the ash like the best. However, in tobacco, quality will tell although a little bit of silicate of soda will go a long way toward holding up its end.

Another smoker use turned up with Linkman's Dr. Grabow pipe, the inside bowl of which was treated with dilute silicate to protect the wood and varnish from heat. Of more importance is the investigation of

the Bureau of Standards that clearly showed that if fire could be confined to the head half of a match the hazards of fire are materially reduced. The estimate counted half a million matches struck to flame every minute. These matches carry the possibility of damaging fire with loss of property and possibly to life. Matches are usually held in a horizontal position, or slightly oblique. They require, on an average, 30 seconds before the stem is burned and the fire extinguished. By treating the match with silicate of soda up to one-half inch of the head, the fire hazard is reduced by one-half. This dip or coating does not interfere with the business end of the match. The Bureau assumed that most fires traceable to lighted matches are due to the flaming beyond the limits of ordinary lighting purposes.

### Silicate as an Agricultural Aid

The office poobah, upon this recitation, added another odd protective use. He is a garden hobbyist and sought protection from bugs. In the Department of Agriculture Yearbook, he learned of a pyrethrum-soap spray which served as an effective combatant against the Japanese beetle. This spray, he found, serves very usefully against other insectivora, particularly the striped cucumber beetle and the spotted squash bug. Toxicity is greatly increased by a small percentage of silicate of soda. Just why this is so is not fully known. The silicate apparently facilitates the wetting of oily surfaces which, in turn, helps the toxic components to reach the victim. It may have a useful part as an emulsion stabilizer.

By this time the funny boy turned up. He had suffered like old Romans of the fifth Century with fallen arches. He had, however, fallen on his feet with a cure that made it possible to continue his work.

"Ladies and Gentlemen I want to remind you," he began, in his usual impresario style, "I want to call your attention to Newfoot, the best, most supporting and, at the same time, most inexpensive device yet developed for the foot of man! First, bandage the foot with several layers of gauze. Add silicate of soda, another layer of gauze and more silicate until the bundle is built to the desired size. Cut away all except the sole and you have the most effective and least costly support for the fallen arch that has yet been found."

It was true; but too much for our poetic soul seriously interested in the decorative arts. She interrupted the diatribe on Newfoot to tell of her success in maintaining decorative sprays on the dining room table throughout the long winter months. Each fall she sought a twig of interesting shape, a well selected branch, which she brushed with silicate of soda. Against the moist branch she cast partially pulverized rock salt and common salt. The frosted sprays gave her a satisfying attractive assortment during the winter in-door days.

Someone suggested that Johnsrud might be treated to a shower of salt and represent Lot's wife.

The Purchasing Agent cynically interposed a kill-joy bit of information. "It's a little stale, folks, but the 'morticians' prepare a small wad of sugar and silicate of soda wrapped in Cellophane—12 to the box—which they slip between your teeth in order to seal the good works. It is, my friends, according to this circular (which he drew from under an ever mounting pile of papers), it is: 'The greatest contribution to embalming practice since the introduction of formaldehyde.'"

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## *Industry's Bookshelf*

**Finishing Metal Products,** by Herbert R. Simonds, 337pp. McGraw-Hill. $3.50.

Coordinating metal finishing processes and finishing problems with the problems of over-all manufacture, the author considers in detail both commercial and technical aspects of such types of finishings as galvanizing, polishing, plating, lacquering, and painting. Cleaning and descaling methods are also studied.

**Marketing of Manufactured Goods,** by Newel Howland Comish, 282pp. The Stratford Co. $3.00.

Stressing merits and disadvantages of each of the wholesale marketing channels, and attempting to devise constructive improvements for each, Dr. Comish has written a critical analysis of modern merchandising and marketing methods. Well written and timely.

**Labor and The Government,** 413pp. Published for the Twentieth Century Fund, Inc., by McGraw-Hill. $2.75.

These findings of the Twentieth Century Fund's research staff in its investigations into recent labor problems include a definite program of action to deal with labor difficulties through governmental authority. Well edited and constructive material.

**Financial Management,** by James O. McKinsey. Revised by Willard J. Graham. 534pp. American Technical Society.

A thorough study of capital requirements, sources, and disbursements, cash and credit control, and the relation of bookkeeping and auditing to financial control. Hardly a handbook, the book can scarcely be considered a text, but it should be valuable to the beginner seeking a practical treatise on financial methods.

**Mechanization in Industry,** by Harry Jerome, 400pp. National Bureau of Economic Research, Inc.

Mechanization, a Frankenstein conception to some and a dream of ease and plenty to others, is presented with a wealth of detail in this truly remarkable book. Just what types of change machines have made in industry should no longer be a hazy conception to the average man, for Mr. Jerome tells, in realistic fashion, the story of mechanization.

**Imperial Preference vis-a-vis World Economy**, by Benoy Kumar Sarkar, 164pp. N. M. Ray-Chowdhury & Co., Calcutta. Price rupees five.

An examination of imperial preference in relation to the international trade and national economy of India. The facts presented in this unique book throw considerable light on modern theories of free trade and protection in world trade problems.

**Laboratory Exercise in Inorganic Chemistry,** by G. H. Cartledge and H. M. Woodburn, 149pp. Ginn & Co. $1.00.

Laboratory manual to be used with "Introduction to Organic Chemistry" by Mr. Cartledge. Preparation work is an outstanding feature of this manual.

# Coal Tar Oils for Internal Combustion Engines

## By C. H. S. Tupholme

AN investigation has just been concluded by the British Institution of Gas Engineers into the use of coal tar oils in internal combustion engines. Creosote has been used successfully by buses in Belfast for five years, as well as in other cities, and the investigation was undertaken with the object of collating experiences, particularly on heavy commercial vehicle chassis.

The chief problem is that of carburization, and this has been successfully solved in Belfast, at any rate, by the use of the Solex "Bi-Fuel" system. In this a large carburetor is used for the tar oil fuel and a small carburetor for the petrol. The small size of the latter prevents the use of petrol for purposes other than starting up, idling, and running at low speed. The petrol carburetor is controlled by hand, the tar oil control being linked to the accelerator pedal, depression of which cuts off the petrol carburetor. A special manifold, cast integrally with the exhaust pipe and heated by the flow of exhaust gases through it, is substituted for the ordinary manifold. It provides highly heated impact surfaces for the oil leaving the main carburetor, a moderately heated length of pipe to induce further fogging by warmth and turbulence and port leads arranged to take off from the coolest parts and so disposed that directional charge bias is avoided.

The choke area of the oil carburetor is the same as for petrol, but the main jet is several sizes larger than when petrol is used due to the higher viscosity of the oil fuel. A lost-motion device ensures that, when the throttle is opened, the petrol throttle is entirely shut and that when the oil is shut off by the large carburetor throttle, the small carburetor continues to supply slow-running facilities on petrol, a flat spot being thus avoided. This entails the insertion of a second throttle between the hand-controlled petrol throttle and the induction pipe proper. This second throttle is entirely shut by the action of opening the oil throttle, but is left partially open when the oil throttle is shut in order that the engine may idle on petrol.

In the A.E.C.-Solex System, the Solex principle is modified by the incorporation of thermostatic control which automatically changes over from one fuel to the other according to the temperature of the engine. This prevents the driver from running on tar oil fuel before the engine is sufficiently warm to vaporize the fuel properly. The induction manifold was improved by designing it in sections with an expansion joint. This obviates the liability to fracture shown by a large single-piece casting.

The chief advantage of a tar oil fuel to the user is its low cost compared with petrol. In some cases, users report a greater mileage per gallon than with petrol even when allowance is made for the petrol used for starting up and idling. In one case an increased mileage amounting to as much as 50 per cent. was reported, though the fuel-saving is generally of the order of 10-15 per cent. The saving in fuel cost is, of course, much greater due to the low cost of the tar oil fuel relative to petrol. Some users are very enthusiastic in describing the savings realized.

In some instances where maintenance costs have been increased as a result of the use of tar oil fuel, the savings in fuel have been to a greater or less extent offset by these extra costs. Tar oil fuels make the best showing when they are employed in vehicles covering long journeys with relatively few stops. When stops are frequent and journeys are short, the ratio of the consumption of the tar oil to the petrol used for starting up and for idling drops and may, in some cases, reach a very low figure.

Tar oil fuel appears to have no great effect on the liveliness, acceleration, and hill-climbing ability of an engine or vehicle, especially when the engine is hot. The first two features are, in the opinion of some users, not quite as good as with petrol, while opinion is equally divided as to whether hill-climbing ability is improved or slightly reduced. Similarly, the effect on the maximum speed of the vehicle is not marked and, indeed, most users have found that maximum speed is unaltered.

In most cases it is reported that the engine cannot be made to knock at low speeds. This is especially the case when the compression ratio has been raised. In one instance, reference is made to the fact that knocking

occurs during hill-climbing only if the fuel is completely free from tar acids. One user reports that pinking occurs at a higher speed than when petrol is used, while another user is of the opinion that knocking is less than with petrol.

The engine tends to be slightly woolly when tar oil fuel is used.

It may here be mentioned that the spark is often slightly advanced when tar oil fuel is used, the charge being fired shortly before the completion of the compression stroke.

Reference must be made to a large number of drawbacks associated with the use of tar oil fuels. Some users have had little or no trouble over long periods while others have had so many troubles that they have decided that the use of such fuels is definitely impracticable. Some of the disadvantages are readily cured, but others are not.

The exhaust gases have generally a pronounced odor of creosote but are clear under normal running conditions. There is generally a puff of smoke during the change-over from petrol to tar oil, during gear changing and during acceleration. Several complaints were made by the public about the smell from the exhaust gases during experiments on the use of tar oils in omnibuses in London and Wigan. This was even the case in London when a London omnibus company incorporated in the carburetor a form of air valve which enabled the smoke to be considerably lessened but not entirely eliminated. It was found, however, that the adjustment and functioning of the air valve were extremely delicate and increased the difficulties resulting from the choking of the pilot jets, since stickiness tended to develop in the air valve as a result of gum formation which, in turn, prevented its correct closing and thus interfered with the slow running. It also was found that, when the carburetor was adjusted in such a manner as to eliminate smoke and to give a satisfactory exhaust gas analysis comparable with the petrol engine, a distinct flat spot occurred in the carburization.

At Manchester, where tests were carried out on buses without alteration to the engine and with use of a crude naphtha fuel, the experiments were discontinued owing to the objectionable nature of the exhaust gases. One good feature is shown by the exhaust gases from engines running on tar oil fuel, namely, the comparative absence of carbon monoxide.

## Beechwood as Pulp for Artificial Silk

Recent experiments with beech prove that it is a satisfactory source of pulp in the manufacture of artificial silk, and that it has advantages in producing an excellent, highly viscous cellulose. *Wochenblatt für Papierfabrikation* reports that cooking is done in a strong lye, 5 to 6% of $SO_2$. Control of the cooking is difficult and requires experience, as the viscosity of the cellulose depends essentially on the conditions in this step in the process.

## Lead and Zinc Pigments '34

Statistics covering the quantities of lead and zinc pigments sold and used by producers in '34, furnished by the U. S. Bureau of Mines, indicate that in comparison with the previous year lead pigments made a relatively better showing than zinc pigments. With the exception of basic lead sulfate, which declined 11 per cent. in quantity, sales of all lead pigments were larger in '34 than in '33, the increases being as follows: Red lead 22 per cent., litharge 12 per cent., white lead (dry and in oil) 8 per cent., and orange mineral 1 per cent. The average values reported by producers for lead pigments ranged from 2 to 5 per cent. higher in '34, except that for dry white lead which increased 13 per cent.

Sales of zinc oxide and leaded zinc oxide declined 12 per cent. and 10 per cent., respectively, in '34, whereas sales of lithopone were 3 per cent. larger than the preceding year. Of the zinc salts, the quantity of zinc chloride sold and used in '34 was 45 per cent. less than '33 while sales of sulfate increased 19 per cent. Average values reported for zinc pigments and salts for '34 were consistently higher than in the preceding year, with the exception of that for zinc chloride which was unchanged. The increases were as follows: Leaded zinc oxide 11 per cent., zinc oxide 8 per cent., lithopone one per cent., and zinc sulfate 8 per cent.

*Lead and zinc pigments and zinc salts sold by domestic manufacturers in the United States*, 1933-34

| | 1933 | | | 1934 | | |
|---|---|---|---|---|---|---|
| | | Value | | | Value | |
| | Short tons | Total | Per ton | Short tons | Total | Per ton |
| Basic lead sulfate or sublimed lead: | | | | | | |
| White | 7,320 | $ 736,404 | $101 | 6,399 | $ 677,897 | $106 |
| Blue | 625 | 65,525 | 105 | 668 | 69,043 | 103 |
| Red lead | 21,988 | 2,637,640 | 120 | 26,743 | 3,279,013 | 123 |
| Orange mineral | 231 | 45,928 | 199 | 234 | 50,778 | 217 |
| Litharge | 61,193 | 6,197,124 | 101 | 68,733 | 7,083,569 | 103 |
| White lead: | | | | | | |
| Dry | 24,628 | 2,763,630 | 112 | 22,569 | 2,838,709 | 126 |
| In oil* | 48,354 | 8,372,689 | 173 | 56,165 | 10,002,820 | 178 |
| Zinc oxide | 98,542 | 10,379,937 | 105 | 87,088 | 9,851,421 | 113 |
| Leaded zinc oxide | 22,868 | 2,011,761 | 88 | 20,506 | 2,018,935 | 98 |
| Lithopone | 140,831 | 11,751,500 | 83 | 145,565 | 12,235,624 | 84 |
| Zinc Chloride, 50° Baume | 32,187 | 1,459,745 | 45 | 17,555 | 786,462 | 45 |
| Zinc sulfate | 5,698 | 221,780 | 39 | 6,783 | 288,180 | 42 |

* Weight of white lead only but value of paste.

*Sales of lead and zinc pigments, by uses*, 1933-34

| | 1933 Short tons | 1934 Short tons |
|---|---|---|
| *White lead* (dry and in oil) | | |
| Paints | 68,368 | 75,008 |
| Ceramics | 1,617 | 1,434 |
| Other | 2,997 | 2,292 |
| | 72,982 | 78,734 |
| *Red lead* | | |
| Storage batteries | 12,949 | 15,987 |
| Paints | 7,182 | 8,766 |
| Ceramics | 715 | 595 |
| Other | 1,142 | 1,395 |
| | 21,988 | 26,743 |
| *Orange mineral* | | |
| Color pigments | 96 | 68 |
| Ink manufacture | 18 | 24 |
| Other | 117 | 142 |
| | 231 | 234 |
| *Litharge* | | |
| Storage batteries | 27,327 | 30,024 |
| Insecticides | 11,126 | 12,271 |
| Oil refining | 6,070 | 7,614 |
| Ceramics | 5,438 | 6,696 |
| Chrome pigments | 3,973 | 6,162 |
| Rubber | 2,875 | 2,466 |
| Varnish | 610 | 414 |
| Linoleum | 106 | 104 |
| Other | 3,668 | 2,982 |
| | 61,193 | 68,733 |

| | 1933 Short tons | 1934 Short tons |
|---|---|---|
| *Basic lead sulfate* | | |
| Paints | 7,072 | 6,611 |
| Storage batteries | 99 | 139 |
| Rubber | 161 | 93 |
| Other | 613 | 224 |
| | 7,945 | 7,067 |
| *Lithopone* | | |
| Paint, varnish and lacquers | 106,995 | 114,472 |
| Floor coverings and textiles | 18,472 | 14,811 |
| Rubber | 5,078 | 4,596 |
| Other | 10,286 | 11,686 |
| | 140,831 | 145,565 |
| *Zinc oxide* | | |
| Rubber | 53,869 | 50,145 |
| Paints | 29,218 | 23,741 |
| Floor coverings and textiles | 4,087 | 4,781 |
| Ceramics | 2,639 | 2,963 |
| Other | 8,729 | 5,458 |
| | 98,542 | 87,088 |
| *Leaded zinc oxide* | | |
| Paints | 22,488 | 20,376 |
| Rubber | 46 | 28 |
| Other | 334 | 102 |
| | 22,868 | 20,506 |

# Use of Chemicals in Mob Control

## By Robert E. Sadtler

THE use of chemicals is the most humane and most efficient method yet devised for the suppression of internal civil disorders. The use of non-toxic gas, or tear gas is authorized, but toxic gases such as phosgene or materials like white phosphorus are prohibited. Smoke producing materials may be used in operations against mobs.

The character of chemical agent used, and the method of dispersion, depends largely upon the size and estimated intentions of the mob which is to be controlled. The sprinkling system, one of the newest methods, is very effective when properly used. It consists of: pouring or spraying gas from airplanes, pouring gas out of a container from a moving vehicle, or pouring the chemical in liquid form from windows of buildings overlooking the mob. Dispersing the gas with the aid of the exhaust gases from the automobile is useful in disturbances in mountainous regions where it is desired to deny the use of a mountain road or trail to an advancing mob. The method might also be used in and around industrial plants to prepare for the expected advance of a mob. Except for the operators in an airplane, all persons engaged in sprinkling gas from containers should be masked. A persistent tear gas (one which lingers in the place where it is released for some time), such as brombenzylcyanide, is most widely recommended for this work.

There are three general types of mobs with which the police and military have to deal. First, a fairly well-armed group of men in numbers from 500 up to a few thousand and with some discipline. Such mobs are usually fairly difficult to deal with as they are intent upon the destruction of life or property. The second type is composed of men poorly armed, with little discipline, and poorly organized. This type is less difficult to control than the first and may be dispersed without great injury to either the troops or themselves. The third type has a mixed composition—men, women, and often small children, unorganized and poorly armed, but excited and irresponsible. These mobs are usually easy to disperse, but great care must be exercised to prevent the injury which will result when a panic-stricken body of men and women start to stampede.

The psychological effect of gas upon a mob is greater than its physical effect. Gas arouses a person's instinctive fears of being smothered and choked and at the same time losing his vision. A tear gas, like chloracetophenone, will practically close a man's eyes, while a sneezing and vomiting gas will interfere with his breathing. The only way to avoid these effects is either by wearing a gas mask or by keeping out of the gas cloud. A cloud of tear gas is invisible, and its odor will not be detected by a mob until it is too late to prevent the gas taking effect.

Gas clouds ordinarily do not rise over 30 feet from the ground and as gas has a greater density than air, the cloud is usually found near the surface of the ground. The layer next to the ground is the most concentrated and most powerful in its effects.

The psychological effect is greatly enhanced when gas is used at night. Gas is generally used against both the front and flank of the mob, but provision is always made for the escape of the mob from the immediate vicinity of the area being gassed. Sufficient tear gas is retained on the bodies and clothing of members of the mob so that the effect of the gas continues for some time after they are out of the actual gas cloud.

Gas may also be used to advantage against barricaded groups of men in buildings. A tear gas grenade shot into the window of the top floor of a building will produce a large cloud of gas which will slowly enter the halls, roll down the stairs and gas the lower floors. Smoke candles are often used by the military to conceal the use of gas, and they may be used also to furnish protection in case of well-armed mobs.

A persistent tear gas, like brombenzylcyanide, is used when it is desired to deny the streets to a mob or force them to evacuate a certain area. On the other hand, a non-persistent tear gas, such as chloracetophenone, is used when permanent effects are not desired. The type of gas to be used in mob operations is determined by the officer in charge of the chemical troops in the locality.

Some of the most important data to be considered when using gas are:

(1) Location of the mob upon a local map. The officer in charge must determine the immediate location of the mob; the location of strategic points known to be assembling places for the mob; all possible or probable routes of advance of the mob, and their objective. The objective of a mob may change during the riot, a mob may originally intend to seize certain property or persons, and, being frustrated in their attempts, they proceed to destroy all the property within their reach.

(2) The officer in charge must determine what weapons or combination of weapons he will use in dispersing and obtaining control of the mob. He must also specify the type of gas or smoke-producing material to be used. These decisions are generally made after a careful estimate of the situation has been made and after the officer has checked his plans with those of the local authorities.

(3) In arriving at a correct decision, the officer must also consider meteorological conditions and terrain; especially so, if he contemplates the use of cloud gas. Light rains help to build up an effective gas cloud while heavy rains tend to wash the gas down and otherwise neutralize its effect. The turbulence of air currents is another factor which varies during the day. Upward air currents are most prevalent in the mid-afternoon of a hot sunny day. Low atmospheric pressure is an unfavorable indication as clouds of gas will be readily dissipated by the air pockets which start upward air currents. High temperature is a very favorable indication for the use of persistent gases as it increases their concentration in the air by hastening the processes of volatilization. However, the temperature has very little effect upon a non-persistent tear gas, like chloracetophenone.

### Direction of Wind

The prevailing direction of the wind is perhaps the most important thing to be determined if cloud gases are to be used. If the wind is blowing toward the chemical troops, the gas should be released toward the rear of the mob or released in the center of the mob itself. The most ideal conditions are when the wind is blowing into the front or on either flank of the mob. A wind having a velocity of about twelve miles per hour is most advantageous. If gas is used in winds of higher velocity than this, greater quantities must be used to increase the initial concentration of the gas to the most effective point.

The general persistency of all military gases is greatly increased by heavy brush and woods which form good gas pockets, thus increasing the concentration of gas in these places. The officer in charge then estimates the probable path of travel of gas and the distance of gas travel to the mob. Greater quantities of gas must be used to secure the maximum result when the troops are operating at a considerable distance from the mob. The path of travel of gas must be accurately determined so that non-combatant residents of affected areas may be warned in advance.

The officer in charge must also consider the position of his own forces with relation to the vicinity of the mob. This consideration is most essential for the successful supplying, maneuvering and replacement of the troops engaged in the operation.

To successfully use non-persistent gases, it is essential to build up a high initial concentration by rapid fire and then maintain the gas cloud by a reduced rate of fire. A slow rate of fire is sufficient to build up a good concentration of persistent gases.

There are no serious after-effects following exposure to tear gas in field concentrations. Those exposed to tear gases should get in a gas-free atmosphere as soon as possible and their eyes will clear in five or ten minutes.

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## Production Phosphate Rock 1934

Continued expansion of commercial activity in the fertilizer industry was reflected in further advances in mine production and shipments of phosphate rock in '34. Total rock mined, as reported by producers, was 2,871,099 long tons; the corresponding figure for '33 was 2,309,269 tons. Total shipments of 2,834,523 long tons, valued at $10,040,005, showed advances over '33 of 14% in quantity and 28% in value. Total stocks in producers' hands December 31, '34, were 1,044,050 long tons; in 1933, 998,470 tons. Prices were fairly firm for the first 6 months of last year. On July 1 they advanced and kept those levels until the end of the year, when higher prices were quoted. According to one trade journal those quotations have remained unchanged through June 10, '35. No imports into the U. S. were reported in '34. Total exports increased 20% in quantity and 41% in value, being 993,493 long tons, valued at $5,008,532. Last year phosphate rock was mined and shipped in Florida, Idaho, Montana, Tennessee, and Virginia, according to a report issued by the U. S. Bureau of Mines.

In '34, Florida mined 2,446,198 long tons, or 85% of the U. S. total. Shipments of 2,369,334 tons, valued at $8,076,317, constituted 84% of the total tonnage shipped in the U. S., and 80% of the total value. The total commercial output of this state consisted almost entirely of crude rock, although a small tonnage was shipped ground. Shipments were the largest since 1930 in both quantity and value, and showed increases of 11% in quantity and 26% in value over '33. Eighty per cent. of the total shipments from Florida consisted of the following 4 grades, based on B. P. L. (bone phosphate of lime) content; 68 basis, 66 minimum, 24%; 70 minimum, 16%; 72 minimum, 16%; 75 basis, 74 minimum, 24%. Of the total quantity shipped for consumption in the U. S., 83% was for use in superphosphates. High-grade hard rock mined and shipped in Florida amounted to 91,134 long tons, valued at $523,783, or increases of 74% in quantity and 51% in value, compared with '33. Land-pebble rock mined in '34 reached 2,310,605 long tons, an advance over '33 of 357,122 tons, or 18%. Shipments of land-pebble rock (2,249,304 tons, valued at $7,466,087), increased 9% in quantity and 24% in value, compared with '33. Soft rock shipped from Florida in '34 totaled 28,896 long tons, valued at $86,447, compared with 16,841 tons, valued at $48,802 in '33. Total stocks of about 872,000 tons in producers' hands December 31, '34, showed an increase of 10% compared with '33. The records showed that Florida's export trade prospered by an advance of 23% over '33, while rock shipped for home consumption increased 4%.

In Idaho last year total production of 37,151 long tons, valued at $140,397, was consumed in the U. S., and almost all was used in superphosphates. Small amounts, however, were utilized in the manufacture of various sodium and calcium phosphates and for direct application to the soil.

Shipments in Montana in '34 totaled 2,086 tons, valued at $7,613.

Mine production in Tennessee in '34 was 396,456 tons, or 35% more than in '33. Shipments were 423,879 tons, valued at $1,797,766, or increases of 27% in quantity and 32% in value. Stocks declined 17%.

In Virginia commercial production of apatite as a byproduct in the mining of nelsonite showed substantial increases in both quantity and value over '33.

# CHEMICAL

**_The Photographic Record_**

**_Equipment leaders you may meet at the Chemical Exposition._**

*Frank L. LaMotte, president, LaMotte Chemical Products Co. (pH control).*

*E. G. Miner, in the upper left hand corner, chairman of the board, The Pfaudler Company; Director, Federal Reserve Bank. Above, H. D. Miles, president, Buffalo Foundry & Machine Company and a past president of the Chemical Engineering Equipment Institute. To the right, C. W. Reynolds, president, J. P. Devine Mfg. Co., Inc., of Mt. Vernon, Ill.*

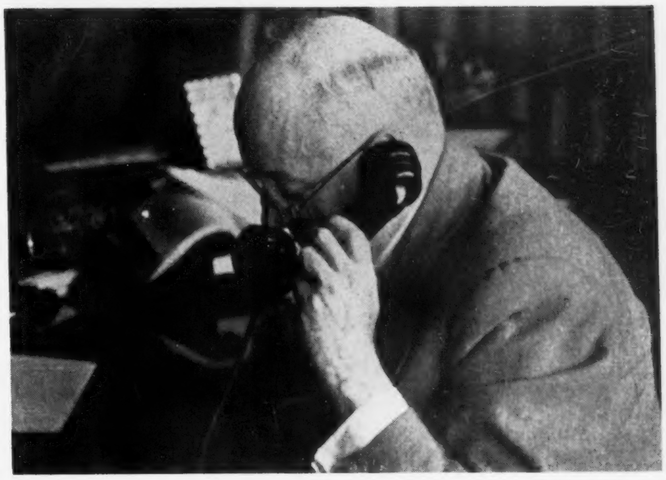
*Donald C. Lamb, manager, industrial chemical sales, Taylor Instrument Co.*

*Below, left, Robert C. Caine, general sales manager, Rochester Engineering & Centrifugal Corp.; center, W. A. Kates, manager, industrial division, and W. C. Taylor, chief chemist, The Corning Glass Works; and right, William P. Gruendler, president, Gruendler Patent Crusher & Pulverizer Co., St. Louis, Mo.*

# NEWS REEL

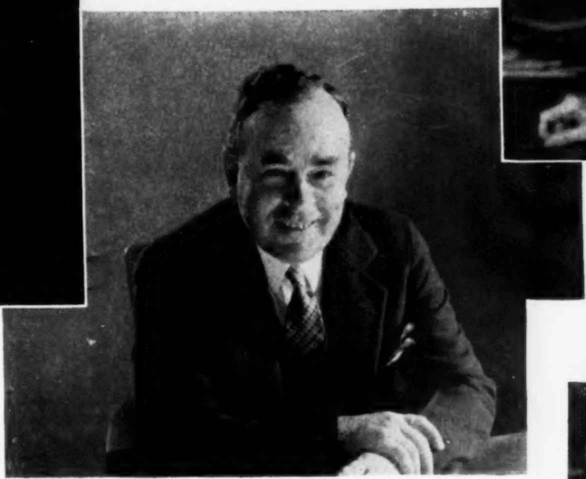
***of Our Chemical Activities***

*E. G. Doezel of the Dracco Corp.*



*Max W. Babb, president, Allis-Chalmers Mfg. Co., and for many years a leader in the deliberations and activities of the Chamber of Commerce of the United States.*

*W. D. Pheteplace, of the Pfaudler Company, original manufacturers of glass-lined steel apparatus and tanks.*



*Above, Valentine Hiergesell, head of the firm of Hiergesell Bros., manufacturers of precision instruments in Philadelphia, Pa. To the right, J. L. Ferguson, the power behind the Ferguson packaging machinery.*

*D. R. Sperry, head of D. R. Sperry & Co., Batavia, Ill.*

*Ralph E. Williams, B. F. Gump Co., Chicago, Ill., son-in-law of R. R. Vaughan, Westvaco Chlorine Products, Inc.*

# New Chemicals of Commerce

***A catalog of new chemical products introduced during 1934-35 by the advertisers in CHEMICAL INDUSTRIES and the CHEMICAL GUIDE-BOOK.***

### ABOPON

A complex borophosphate. Viscous, water-white liq.; completely sol. water, glycerin (hot); insol. oils, alcohol, hydrocarbons. Hardens on exposure to air, forming transparent, colorless, glass-like films which do not discolor with age or in sunlight. Solutions in water have low viscosity but high Sp. Gr. and surface tension. Uses: adhesives, flameproofing; coatings for paper, wood, leather, etc. Glyco Products Co., Inc.

### ACETAMIDE, C. P. ODORLESS

$CH_3CONH_2$. White, odorless crystals. Sp. Gr. 1.15. M. P. 79-81° C. B. P. 215-221° C. Very sol. water, most organic compounds. Uses: soldering pastes and fluxes; plasticizer for cellulose esters; solvent for most organic and inorganic compounds; solubilizing dyestuffs; hygroscopic agent; textile bleach activator. Niacet Chemicals Corp.

### ACETOACETANILIDE

Although known for half a century, extensive use of this product has been retarded by comparatively high cost and lack of ready source of supply. Treated with suitable reagents, it can be made to yield potentially interesting halogen, alkali metal, acyl, alkyl derivatives, substituted quinolines and ring compounds such as pyrazolones, pyrimidines, etc. Uses: principally in production dyestuffs known as Hansa colors. Carbide & Carbon Chemicals Corp.

### ACID, RICINOLEIC—AMECCO

Acid ricinic and acid hydroxy oleic. The fatty acid from castor oil. $CH_3(CH_2)_5CHOHCH_2$-CH:CH $(CH_2)_7COOH$. Sp. Gr. 0.945. Mol. wt. 298.27. M. P. 17°C. B. P. 250/15. Insol. water; partly sol. alcohol, ether, hydrocarbons. Uses: manufacture resins; special soaps; and esters. American Chemical Products Co.

### ACTICARBONE—AC

An improved, patented process using readily obtainable raw materials to produce a dense, hard and highly active adsorbent by agglomeration, followed by gas activation in special furnaces. Has a tough surface and extremely porous structure, assuring long life through resistance to abrasion and attrition, plus high adsorptive capacity. Superior in long life and activity to carbons hitherto made from nuts and pits. Uses: for recovering solvent vapors; in gas purification and deodorization; and in gas masks. Acticarbone Corp.

### AEROGEL

Silica in a new form. Similar to a liquid silica gel except that water is replaced by air in pores of infinitely small size. An extremely light product weighing around 7 lb. per cu. ft. It will form gels with almost any liquid and will absorb materials such as grease. Similar products can be made from materials other than silica. Merrimac Chemical Co.

### AJAX PLUS

"A Faultless Anti-Freeze." This product is more than just an anti-freeze—it is a truly scientific radiator protector, possessing many exclusive advantages over other types of anti-freeze. Has all the good points of Ajax Denatured Alcohol: Extra reserve protection; greater permanence (lasts longer); greater safety; a patented anti-rust agent; an exclusive tamper-proof feature. Commercial Solvents Corp.

### ALPHASOL OT (10% Aqueous)

One part in 1000 parts of water reduces the surface tension from 73 to 29.2 (dynes/c.m., du Nouey). Sol. water, all organic solvents, mineral and vegetable oils. Uses: a powerful wetting agent. American Cyanamid & Chemical Corp.

### ALPHASOL OT (100%)

One part in 1000 parts of water reduces the surface tension from 73 to 29.2 (dynes/c.m., du Nouey). Sol. water, all organic solvents, mineral and vegetable oils. Uses: a powerful wetting agent. American Cyanamid & Chemical Corp.

### ALUMINUM STEARATE—LIQUID

METASAP 567. A new solvent combination which is a solution of metallic soaps, principally aluminum stearate, containing about 30% non-volatile matter. In spite of the high metallic soap content, it has a viscosity about equal to water. It may be diluted with an inexpensive petroleum thinner. Upon evaporation of the solvents, a clear colorless, odorless, homogeneous film results. Uses: to waterproof all kinds of materials, such as textiles, fiber boards, paper, etc. Natural Oil Products Co., Inc.

### 3-AMINOPHTHALHYDRAZIDE

Known also as "Luminol." $C_6H_3(CONH)_2NH_2$. Reacts with oxidizing agents to produce a brilliant light without noticeable evolution of heat, presenting one of the most beautiful and striking displays in chemistry. Eastman Kodak Co.

### ANT KILLER—CYANOGAS

Not a new article but a new use and a new form of packing. Spouted 4-oz. can is designed for treating nests in gardens and lawns. Simply enlarge entrances of ant nest with long shank screw-driver. Probe six to eight inches to be sure of reaching deeper part of nest where Queen is located. A small amount injected into nest destroys the Queen and worker ants instantly. American Cyanamid & Chemical Corp.

### ARIDEX WP

An improved waterproofing, spot-proofing agent for textiles which can be applied in a one-bath process. It is a stabilized wax emulsion offering advantages in its ease of application to textile materials. E. I. du Pont de Nemours & Co., Inc.

### ASTROTONE

A fixative of importance to anyone interested in the fine art of making perfumes. Reminiscent of Musk Tonkin with a suggestion of Ambrette seed, it gives new life and warmth and lasting quality to perfumes. Because it is water-white and does not discolor, it may be used in many preparations other than perfumes. E. I. du Pont de Nemours & Co., Inc.

### ASTRULAN

A neutral, refined oriental vegetable oil for use in conjunction with Ursulin in fat liquoring white leather. Being of high purity, it is especially adaptable for use on white leather, because it imparts no color to the leather and is a non-oxidizing product. American Cyanamid & Chemical Corp.

### AVONAC

A yellow oily liquid. Uses: as a wetting-out agent and penetrating agent for textile processing, particularly to promote level dyeing. National Aniline & Chemical Co., Inc.

### BENZOL, C. X. P.

A super-refined grade of benzol. Has general high degree of purity and was developed to meet the most exacting requirements of the chemical industry. Freezing Point 5.40° C. Boiling Range 0.6° C. Bromine Index 3. Jones & Laughlin Steel Corp.

### BENZOL, J & L REAGENT

The absolute perfection in benzol refining, accepted as a laboratory standard. It is thiophen free. Freezing Point 5.50° C. Bromine Index Zero. Boiling Range 0.4° C. 97% distils within a range of 0.1° C. Jones & Laughlin Steel Corp.

### BENZYL PARASEPT

(Benzyl Para-Hydroxy Benzoate). A white, crystalline powder, having faint characteristic odor. M. P. 111°C. Solubility in water at 20°C. approx. 1-10,000; in alcohol at 20°C. approx. 1-2. Uses: as a preservative. Heyden Chemical Corp.

### BRIGHT ZINC

A low-cost, decorative, rust-resistant zinc coating produced on steel surfaces by a new electro-plating process. Attractive zinc finishes, quite resistant to atmospheric tarnish and finger staining, can be produced up to .003" in thickness on a wide variety of articles. E. I. du Pont de Nemours & Co., Inc.

### BRILLIANT INDIGO 4BR PRINTING POWDER

NATIONAL Brand. Vat printing powder which is instantly dispersible into the "printing gum." Remains unchanged indefinitely, instead of drying out, settling or freezing, thus assuring a closer check on actual shop consumption and a more positive adherence to established standards as successive patterns are returned for "repeats." Penetration is achieved to a degree not attained by other forms of vat colors. Fine lines and scroll work possess the same depth and density of color as do broad stripes and open work. National Aniline & Chemical Co., Inc.

### BUTYL CROTONATE

$CH_3$-CH-CH-$COOC_4H_9$. Colorless liquid, pleasant odor. Sp. Gr. 0.904 at 15.6° C. B. P. 180-185° C. Miscible with alcohol, ether, various other esters. Uses: formulation of special cellulose ester lacquer and emulsions; perfume bases. Niacet Chemicals Corp.

### CALCOLOID

A new line of dispersible, dustless vat color powders for printing and dyeing.* The printing types are superior to the vat pastes for printing because of their high degree of dispersibility, freedom from specks upon printing and full color development on short ageing. When added in dry form directly to the printing gum these powders will thoroughly wet out and disperse in the short time required to incorporate them in the gum. The dyeing types are for application to piece goods by the Pad-Jig method, and for pigment dyeing in Franklyn or pressure machines, giving uniform penetration in the yarn package or raw stock. The Calco Chemical Co., Inc.

* *Patents applied for.*

### CARBANTHRENE PRINTING BLACK J DOUBLE POWDER

NATIONAL Brand. Vat printing powder which is instantly dispersible into the "printing gum." Remains unchanged indefinitely, instead of drying out, settling or freezing, thus assuring a closer check on actual shop consumption and a more positive adherence to established standards as successive patterns are returned for "repeats." Penetration is achieved to a degree not attained by other forms of vat colors. Fine lines and scroll work possess the same depth and density of color as do broad stripes and open work. National Aniline & Chemical Co., Inc.

## CARBANTHRENE PRINTING BLACK JB DOUBLE POWDER

NATIONAL Brand. Vat printing powder which is instantly dispersible into the "printing gum." Remains unchanged indefinitely, instead of drying out, settling or freezing, thus assuring a closer check on actual shop consumption and a more positive adherence to established standards as successive patterns are returned for "repeats." Penetration is achieved to a degree not attained by other forms of vat colors. Fine lines and scroll work possess the same depth and density of color as do broad stripes and open work. National Aniline & Chemical Co., Inc.

## CARBANTHRENE PRINTING BLUE GCD DOUBLE POWDER

NATIONAL Brand. Vat printing powder which is instantly dispersible into the "printing gum." Remains unchanged indefinitely, instead of drying out, settling or freezing, thus assuring a closer check on actual shop consumption and a more positive adherence to established standards as successive patterns are returned for "repeats." Penetration is achieved to a degree not attained by other forms of vat colors. Fine lines and scroll work possess the same depth and density of color as do broad stripes and open work. National Aniline & Chemical Co., Inc.

## CARBANTHRENE PRINTING BLUE GREEN FFB DOUBLE POWDER

NATIONAL Brand. Vat printing powder which is instantly dispersible into the "printing gum." Remains unchanged indefinitely, instead of drying out, settling or freezing, thus assuring a closer check on actual shop consumption and a more positive adherence to established standards as successive patterns are returned for "repeats." Penetration is achieved to a degree not attained by other forms of vat colors. Fine lines and scroll work possess the same depth and density of color as do broad stripes and open work. National Aniline & Chemical Co., Inc.

## CARBANTHRENE PRINTING FLAVINE GC DOUBLE POWDER

NATIONAL Brand. Vat printing powder which is instantly dispersible into the "printing gum." Remains unchanged indefinitely, instead of drying out, settling or freezing, thus assuring a closer check on actual shop consumption and a more positive adherence to established standards as successive patterns are returned for "repeats." Penetration is achieved to a degree not attained by other forms of vat colors. Fine lines and scroll work possess the same depth and density of color as do broad stripes and open work. National Aniline & Chemical Co., Inc.

## CARBANTHRENE PRINTING VIOLET RR POWDER

NATIONAL Brand. Vat printing powder which is instantly dispersible into the "printing gum." Remains unchanged indefinitely, instead of drying out, settling or freezing, thus assuring a closer check on actual shop consumption and a more positive adherence to established standards as successive patterns are returned for "repeats." Penetration is achieved to a degree not attained by other forms of vat colors. Fine lines and scroll work possess the same depth and density of color as do broad stripes and open work. National Aniline & Chemical Co., Inc.

## CARBANTHRENE PRINTING YELLOW G DOUBLE POWDER

NATIONAL Brand. Vat printing powder which is instantly dispersible into the "printing gum." Remains unchanged indefinitely, instead of drying out, settling or freezing, thus assuring a closer check on actual shop consumption and a more positive adherence to established standards as successive patterns are returned for "repeats." Penetration is achieved to a degree not attained by other forms of vat colors. Fine lines and scroll work possess the same depth and density of color as do broad stripes and open work. National Aniline & Chemical Co., Inc.

## CARBON BLACK—COBLAC

A master grind of high intensity color black in nitrocellulose, eliminating the difficulties inherent in the old type of grinding carbon blacks in nitrocellulose lacquers. A solution of this in the customary solvents, plus the addition of desired resin and plasticizer, produces a super quality black lacquer. The resulting film has the new properties of: Enormously improved gloss and intensity of blackness; retention of gloss during long exposure to the elements; elimination of fading, checking, and chalking, and need for adding toners or other dyestuffs. Protected by U. S. Patents 1,848,213 and 1,987,980. Binney & Smith Co.

## CARBON BLACK—DISPERSO

(Powder.) A patented process for a compressed carbon black that results in unique properties. Two forms are available: (1) an impalpable powder passing 99.9% through a 325 mesh screen, (2) a dustless black (pellet form). Superior dispersion characteristics and a marked increase in reenforcement properties are obtainable with it. Uses: for rubber manufacture. Wishnick-Tumpeer, Inc.

## CARBON BLACK—DISPERSO

(Dustless.) A patented process for a compressed carbon black that results in unique properties. Two forms are available: (1) an impalpable powder passing 99.9% through a 325 mesh screen, (2) a dustless black (pellet form). Superior dispersion characteristics and a marked increase in reenforcement properties are obtainable with it. Uses: for rubber manufacture. Wishnick-Tumpeer, Inc.

## CARBON BLACK—HIBLAK

A pure colloidal carbon black suspension for tinting or coloring concrete highways, pavements, flooring, and architectural concrete in general. Color is permanent, uniform, and safe for concrete. Produces permanently dark colored and attractive concrete streets, etc.; eliminating eyestrain and fatigue resulting from glaring surfaces. Uniform color in repair work is now made simple and practical, and repairs and oil drippings are no longer unsightly. Binney & Smith Co.

## CARBON BLACK—NEO-SPECTRA

The rapid rise in the use of synthetic resins for automobile and other finishing has demanded a carbon black especially fitted to this work. Whereas ordinary high intensity color blacks are difficult to wet with synthetic resin, this product is vehicle-seeking instead of vehicle-repellent. Uses: in the field of alkyd resin enamels. Protected by U. S. Patents 2,013,774 and 2,013,775. Binney & Smith Co.

## CARBONATE OF POTASH, CALCINED

A white, dustless, free-flowing, granular product. 99-100% $K_2CO_3$. Uses: because of its very high purity, it is ideally suited to the glass, ceramic, textile, soap and chemical industries. Niagara Alkali Co.

## CARBONATE OF POTASH, CALCINED, 96-98%

ISCO Brand. As in the case of the hydrated form, this grade is now produced in the United States from a high grade American raw material, and, while guaranteed 96-98%, it actually tests between 98-100%. Note its uniform granulation and freedom from dusty particles. Practically free from objectionable impurities. Innis, Speiden & Co.

## CARBONATE OF POTASH, HYDRATED

A white, free-flowing, non-caking, granular product; low in iron, soda, sulfate and chloride content. 83-85% $K_2CO_3$. Uses: because of its high purity, it is finding extensive use in the glass, ceramic, textile, soap and chemical industries. Niagara Alkali Co.

## CARBONATE OF POTASH—HYDRATED, 83-85%

ISCO Brand. While formerly obtainable only from Europe, this product is now being made in the United States from the very high grade raw material now obtainable in this country. Innis, Speiden & Co.

## CARBONATE OF POTASH—LIQUID

ISCO Brand. A sparkling, water-white product, free from sediment and objectionable impurities. Guaranteed 47% actual $K_2CO_3$. Uses: to replace the calcined forms of carbonate of potash 80-85% and 96-98%. Innis, Speiden & Co.

## CARBONATE OF POTASH, LIQUID

A sparkling, clear liquid, very low in iron and soda content. 47% $K_2CO_3$ minimum. Uses: convenient method of utilizing potassium carbonate in the textile, soap and chemical industries. Niagara Alkali Co.

## CAUSTIC POTASH—GRANULAR

ISCO Brand. Full strength, guaranteed 88-92% actual KOH. Notably free from dust particles, being prepared with this in mind. Uses: for chemical specialty use and for glass manufacturers as a substitute for carbonate of potash. Innis, Speiden & Co.

## CAUSTIC POTASH, GRANULAR

A granular, free-flowing product of standard strength and purity. 90% actual KOH minimum. Screened between 10 and 40 mesh, this form is particularly adapted to the needs of the glass industry. Niagara Alkali Co.

## CELITE, J-M NO. 521

An acid-washed, calcined, diatomaceous silica filter aid made from specially processed, selected mineral. It is chemically and physically inert, hence does not affect color or any of the congeneric constituents of liquors. Uses: in filtering whiskies and other spiritous liquors; is an ideal filter aid for obtaining clarity of extreme brilliance with maximum rates of flow. Patented by Johns-Manville.

## CEL-O-SEAL—WIND-O-BAND

An opaque cellulose band with transparent sections or "windows." It is applied over the Government tax stamp on bottles of distilled spirits and conforms perfectly to the package. The stamp is protected by the band, yet is readily legible through the transparent "windows." E. I. du Pont de Nemours & Co., Inc.

## CELLULOSE NITROACETATE

Protective-coating base. Non-flammable cellulose derivative; miscible with a large number of plasticizers, and soluble in many solvents. Produces clear solutions and resists moisture. Free films show no tendency to curl or buckle. Uses: in finishing textiles; as a protective coating; and in molding plastics. Hercules Powder Co.

## CELLULOSE SPONGE (DU PONT)

An artificial sponge, made from pure cellulose, which is strong and remarkably durable, yet is soft and pliable when wet. Absorbs twenty times its wt. of water and may be used for drying when wrung out. The quality is always uniform. It is not affected by cleaning chemicals, such as lyes, dilute acids, etc., and will outwear several ordinary sponges. Recommended for bath and toilet purposes; for washing windows, tiling, and walls, etc. E. I. du Pont de Nemours & Co., Inc.

## a-CHLOROQUINOLINE

$C_9H_6NCl$. M. P. 36-38°. Useful to the research chemist because of its extremely reactive chlorine atom which condenses readily with other compounds. Eastman Kodak Co.

## COLORLESS WATERPROOF FINISH No. 44

ISCO Brand. An excellent binder for pigment finishes. When used as a top finish, it produces a beautiful, smooth, semi-bright finish which is quite flexible and water-resistant. Used as top finish in making glazed kid, calf, and side leather. Innis, Speiden & Co.

## COPPER CARBONATE—18%

The 18% copper carbonate or, as it is sometimes known, extended copper carbonate, is also produced from copper sulfate. It is widely used as a fungicide in the treatment of seed wheat, being particularly popular where the infestation of smut is not as severe as to require the use of the pure material. New product of The Mountain Copper Co., Ltd.

## COPPER CARBONATE—52%

The copper sulfate, as produced and described, forms the basis of a further manufacturing process resulting in the production of copper carbonate. Uses: as a fungicide in the control of smut or bunt in wheat. Particular pains are taken to provide a material that is light, fluffy, and having a high degree of adhesiveness. New product of The Mountain Copper Co., Ltd.

# STOP TIME!

**the grim reaper..will he get your fabrics? Will he turn them yellow and rancid?**

## PLAY SAFE WITH CREAM SOFTENER J. B.

• Your finished goods will never develop odor or turn yellow if you use Cream Softener J. B.

Our new method of sulphonating Tallow keeps it from oxidizing, which was one of the main difficulties in the use of Tallow as a softener.

Cream Softener J. B. is equally adaptable for softening cotton warps, yarns, hosiery and raw stock. Its advantages over raw Tallow, soluble oils and other softeners make it the most satisfactory and economical product you have ever used.

## JACQUES WOLF & CO.

**MANUFACTURING CHEMISTS AND IMPORTERS . . . PASSAIC, NEW JERSEY**

*Warehouses:* **Providence, R. I., Philadelphia, Pa., Utica, N.Y., Chicago, Ill., Greenville, S. C., Chattanooga, Tenn.**

## COPPER RESINATE

The widespread use of oil sprays in connection with deciduous fruit growing has led many manufacturers to attempt the incorporation of a satisfactory copper bearing product with the oils. One which holds as much promise as any other is copper resinate as produced by The Mountain Copper Company at Martinez, California. The copper resinate powder is first thoroughly incorporated with pine oils and is supplied to oil spray manufacturers in the form of a dissolved paste of pine oil and copper resinate powder. New product of this company.

## COPPER SULFATE

The small amount of copper present in pyrites as an impurity is extracted by a leaching process after the pyrites has been used for its sulfur content. This copper forms the basis of The Mountain Copper Company's production of bluestone or copper sulfate at their plant near Martinez, California. New product with this company.

## COPPER SULFATE, MONOHYDRATED

This material is prepared by simply eliminating one molecule of water from The Mountain Copper Company's regular production of Bluestone. It is a very popular material for mixing in dry insecticidal and fungicidal dusts. New product of this company.

## CROMODINE

For rustproofing all types of steel products before painting. Steel products are dipped in or sprayed with a solution of it for one minute. Product is then rinsed, tack ragged, and painted. This treatment passivates the steel surface so that the surface currents that lead to rust are stopped. In commercial installations, the cost of chemical used has not exceeded 10 cents per hundred sq. ft. of steel surface treated. American Chemical Paint Co.

## CUPRODINE

For immersion copper plating of wire, strip and similar products. Provides a smooth, even copper surface that simplifies the drawing and working of the metal. American Chemical Paint Co.

## CUPROUS OXIDE

While small quantities are utilized in the manufacture of certain dusts for fungicidal work, its principal use is in the manufacture of marine paint. Production is carried on by a non-electrolytic process which produces a cuprous oxide of satisfactory grade for paint manufacture at a comparatively low cost. New product of The Mountain Copper Co., Ltd.

## DE HAEN'S LUMINOUS AND FLUORESCENT COMPOUNDS

For television, oscillograms, X-ray screens and neon light tubes. These complex chemical compounds are made under rigid scientific control at the electro-chemical laboratories of J. D. Riedel-deHaen A. G., Seelze, near Hannover, Germany. Consonant with their chemical and physical characteristics, they are supplied in the form of fine, free-flowing crystalline powder to aid uniform application and to give the maximum emission of light. All compounds are activated by ultra-violet radiation, and for television purposes, by cathode radiation. When activation is withdrawn, they remain inert. Subjected to cathode-ray bombardment, fluorescent television compounds, made by the "DeHaen" process, possess the pleasing characteristic of emitting a sun-light luminosity, optically agreeable and similar to ordinary photography. Pfaltz & Bauer, Inc., American distributors.

## 2:4 DIAMINOPHENOL DIHYDROCHLORIDE

(Amidol.) Purity min. 99%. M. P. infusible. Sol. water, alcohol; insol. benzol, etc. Uses: as fur dye; photographic developer; dye intermediate. Verona Chemical Co.

## DIBENZYL PHENOL

A viscous oil, practically odorless, and possessing a strong fluorescence. B. P. approx. 256 at 10 mm. and 200 at 1 mm. Sol. most organic solvents, dilute alcoholic alkali. Practically insol. water, dilute alkalies, and acids. Uses: in organic synthesis. Heyden Chemical Corp.

## 2,5-DICHLORANILINE

Purity min. 98%. M. P. 49°C. Sol. organic solvents, aqueous hydrochloric acid; insol. water. Uses: as dye intermediate. Verona Chemical Co.

## DIGLYCOL LAURATE

The lauric acid ester of diethylene glycol. Light colored, practically odorless liq. of low viscosity. Emulsifies readily in water, forming white, permanent emulsions. Sol. oils, hydrocarbons, alcohol, etc. Has low surface tension and penetrates readily. Uses: emulsifying agent, specialty soap for dry-cleaning, etc. Glyco Products Co., Inc.

## DIGLYCOL STEARATE ODORLESS

A white, wax-like solid. M. P. 55° C. Disperses completely on stirring in hot water, forming stable, milky, cream or fluid emulsions. Free from alkalies and amines. Uses: emulsifying and thickening agent producing stable, non-alkaline emulsions. Glyco Products Co., Inc.

## DIMETHYLGLYOXIME—AMECCO

$CH_3C(NOH)C(NOH)CH_3$. White, crystalline solid. M. P. 240-41°F. Very slightly sol. water; sol. alcohol. Uses: precipitant for nickel and other metals; also for manufacture nickel dimethylglyoxime pigment. American Chemical Products Co.

## DIPHENYLTHIOCARBAZONE

$C_6H_5NHNHCSNNC_6H_5$. Forms with lead an intense color proportional to the lead present which enables it to be used as a very sensitive analytical reagent especially for the determination of lead residues on fruit. Eastman Kodak Co.

## DRIERITE

A new form of $CaSO_4$ produced in powdered and granular forms. It is neutral in reaction; stable; constant in volume; inert except towards water; insol. in organic liquids; non-disintegrating; non-wetting; non-poisonous; non-corrosive; and repeatedly regenerative. Performs effective service in removing water from practically all solids, liquids, and gases. Uses: drying agent of high efficiency and unusual versatility. W. A. Hammond.

## DRIERITE, INDICATING

A color-changing drying agent, prepared by impregnating the granules of the regular product with cobalt chloride. On dehydration the active desiccant assumes a distinct blue color. By turning red in service, it gives a clear visual indication of the progress of absorption and exhaustion. Product is regenerative. Uses: in transparent units for the drying of gases. W. A. Hammond.

## ELECTRIC BLASTING CAP

Hercules All-Metal Delay. The timing element is gasless, thus the shell can be totally enclosed as no gas escape openings are required. This protects against moisture and also assures more regular timing. Hercules Powder Co.

## ETHYL ALCOHOL, ABSOLUTE

$C_2H_5OH$. Prepared by an improved process in which the alcohol does not come in contact with benzol, alkalies, or copper sulfate. The water is removed by contacting with a neutral, innocuous salt, resulting in a product of unusually high purity. Commercial Solvents Corp.

## 2-ETHYL BUTYL ACETATE

Colorless liq., mild odor. B. P. 162.4° C. Insol. water. Evaporation rate somewhat less than that of amyl acetate. Uses: solvent for nitrocellulose, gums, resins; in lacquers as a moderately high boiling solvent, which is of value in eliminating "blushing" tendencies: possibilities in brushing lacquers and nitrocellulose printing inks. Carbide & Carbon Chemicals Corp.

## 2-ETHYL BUTYL ALCOHOL

Colorless liq. B. P. 148.9° C. Sp. Gr. 0.8328 at 20/20° C. Ref. index 1.4208. Misc. most organic solvents; slightly sol. water. Uses: adaptation indicated where a high-boiling alcohol is desired; in lacquers; in preparation derivatives such as 2-ethyl butyl acetate and other esters which should find application in perfumes; powerful mutual solvent used to promote miscibility of mixtures ordinarily not mutually soluble. Carbide & Carbon Chemicals Corp.

## ETHYL CELLULOSE

Cellulose ether. A non-flammable, white, granular material; soluble in many cheap solvents; and stable in exposure to light. Film is flexible at low temperatures. Uses: in films, lacquers, and plastics; may be used as toughening agent for plastics, protective coatings, and textile finishing. Hercules Powder Co.

## ETHYL FORMATE

$HCOO.C_2H_5$. Water-white, volatile liquid; pleasant, aromatic, non-residual odor. Sp. Gr. 0.900-0.930 at 20/20°C. Purity 95-100% ester by wt. Distillation Range 51-55°C. Flash Point —19.5°C. (—3.1°F.). Uses: one of the best fungicides and larvicides for treatment of tobacco, cereals, dried fruits, and similar products which are liable to infestation; for medical purposes; in preparation of synthetic flavors. Commercial Solvents Corp.

## 2-ETHYL HEXENAL

A water-white, unsaturated aldehyde containing 8 carbon atoms. This product has some of the characteristics of a drying oil and should have considerable application in the paint and lacquer field. The Grasselli Chemical Co., Inc.

## ETHYL PARASEPT

(Ethyl Para-Hydroxy Benzoate.) A white, crystalline powder, odorless, practically tasteless, and non-toxic. M. P. 117°C. Solubility in water at 100°C. approx. 1-100; in water at 20°C. approx. 1-1000; in alcohol at 20°C. approx. 1-2. Uses: as a preservative. Heyden Chemical Corp.

## ETHYL SILICATE

(Tetra-ethyl ortho silicate)—Colorless, faintly odored liq. B. P. 165° C. Water slowly hydrolyzes it to alcohol and silicic acid which in turn dehydrates to an adhesive form of silica, hence its use as preservative for hardening stone and arresting decay and disintegration. "Paints" formulated with it are unaffected by heat and are used for coating furnace castings. Mixed with siliceous powders, forms weather- and acid-proof mortar and cements, refractory bricks, and other molded objects. Carbide & Carbon Chemicals Corp.

## ETHYLENE DIAMINE

Water-sol. liq. of ammoniacal odor. B. P. 116.1°C. Uses: in medicinals, dyes, rubber accelerators. Low equivalent wt. should make it valuable for neutralizing acidity of oils, preparing casein and shellac solutions, stabilizing rubber latex, as an inhibitor in anti-freeze solutions, and in textile lubricants. Carbide & Carbon Chemicals Corp.

## 2-ETHYLHEXYL PHTHALATE

$C_6H_4(COOC_8H_{17})_2$. B. P. approx. 184°/1 mm. A new oil for use in vacuum condensation pumps; valuable because of the very low vacuum obtainable with it It is relatively inexpensive. Eastman Kodak Co.

## FABRIKOID—SUPER

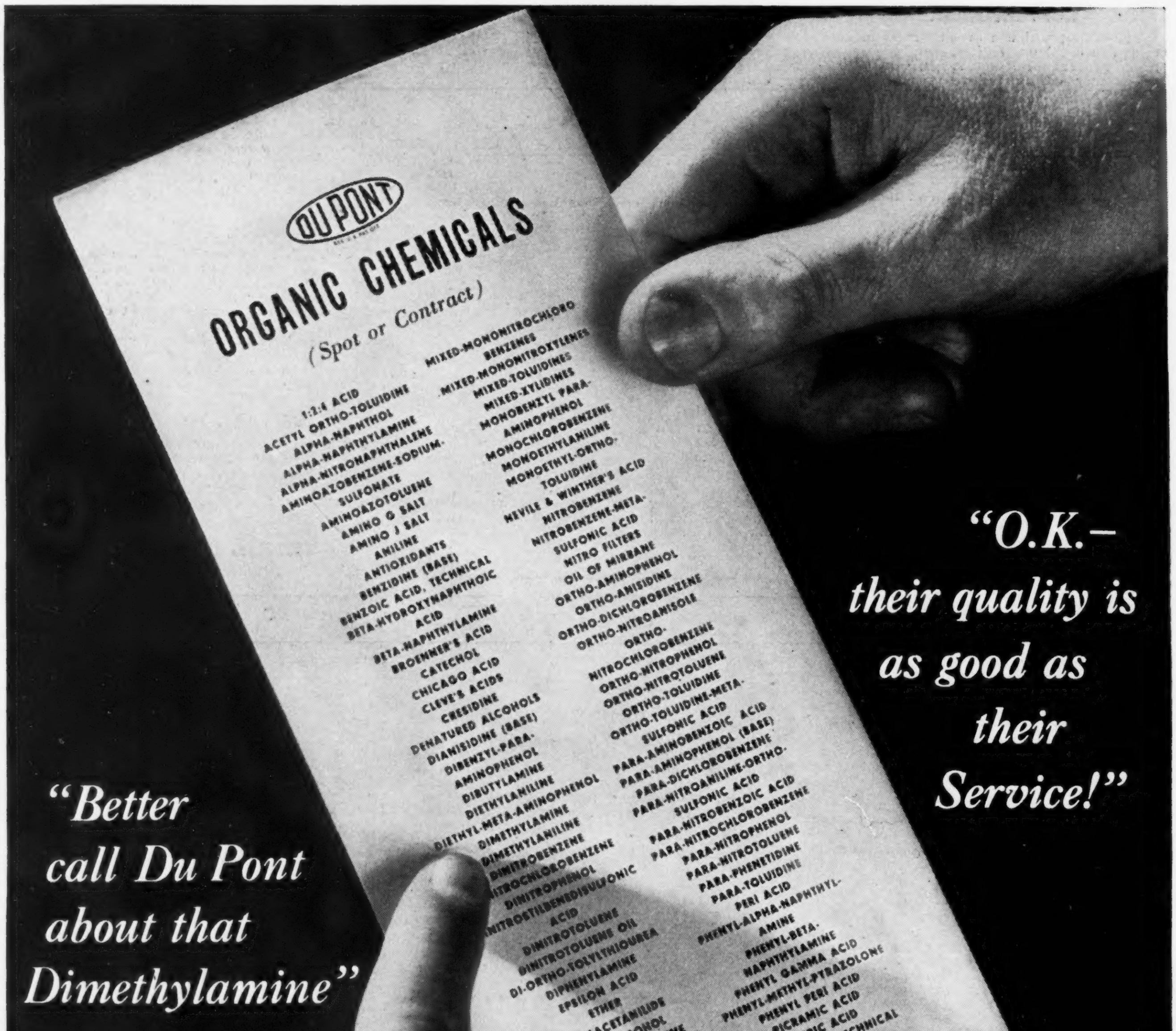
This upholstery material is an improved fabric of a type superior to any pyroxylin coated material now on the market. Its chief advantages are: (1) Exceptional wearing qualities through resistance to film-break: (2) No exudation at extremely warm temperatures. In wt. per yard, it is no heavier than the established qualities. E. I. du Pont de Nemours & Co., Inc.

## FERRIC ACETATE

$Fe(C_2H_3O_2)_3$. Red powder, odorless. Sp. Gr. 1.54. Sol. water, acetic acid; insol. benzene. Uses: source soluble ferric iron; for paints, soaps, medicinal preparations, etc.; textile mordant; wood preservative. Niacet Chemicals Corp.

## FIRE RETARDANT COMPOSITION NO. 1 WG

A mixture of well-known inorganic fire retardant salts in optimum concentrations together with certain organic addition agents which afford the minimum change in textile physical properties of the treated material. Uses: to effectively flameproof textile and paper materials. The Grasselli Chemical Co., Inc.



DU PONT
ORGANIC CHEMICALS
(Spot or Contract)
1:2:4 ACID
ACETYL ORTHO-TOLUIDINE
ALPHA-NAPHTHOL
ALPHA-NAPHTHYLAMINE
ALPHA-NITRONAPHTHALENE
AMINOAZOBENZENE-SODIUM-SULFONATE
AMINOAZOTOLUENE
AMINO G SALT
AMINO J SALT
ANILINE
ANTIOXIDANTS
BENZIDINE (BASE)
BENZOIC ACID, TECHNICAL
BETA-HYDROXYNAPHTHOIC ACID
BETA-NAPHTHYLAMINE
BROENNER'S ACID
CATECHOL
CHICAGO ACID
CLEVE'S ACIDS
CRESIDINE
DENATURED ALCOHOLS
DIANISIDINE (BASE)
DIBENZYL-PARA-AMINOPHENOL
DIBUTYLAMINE
DIETHYLANILINE
DIETHYL-META-AMINOPHENOL
DIMETHYLAMINE
DIMETHYLANILINE
MIXED-MONONITROCHLOROBENZENES
MIXED-MONONITROXYLENES
MIXED-TOLUIDINES
MIXED-XYLIDINES
MONOBENZYL PARA-AMINOPHENOL
MONOCHLOROBENZENE
MONOETHYLANILINE
MONOETHYL-ORTHO-TOLUIDINE
NEVILE & WINTHER'S ACID
NITROBENZENE
NITROBENZENE-META-SULFONIC ACID
NITRO FILTERS
OIL OF MIRBANE
ORTHO-AMINOPHENOL
ORTHO-ANISIDINE
ORTHO-DICHLOROBENZENE
ORTHO-NITROANISOLE
ORTHO-NITROCHLOROBENZENE
ORTHO-NITROPHENOL
ORTHO-NITROTOLUENE
ORTHO-TOLUIDINE
ORTHO-TOLUIDINE-META-SULFONIC ACID
PARA-AMINOBENZOIC ACID
PARA-AMINOPHENOL (BASE)
PARA-DICHLOROBENZENE
PARA-NITROANILINE-ORTHO-SULFONIC ACID
PARA-NITROBENZOIC ACID
PARA-NITROCHLOROBENZENE
PARA-NITROPHENOL
PARA-NITROTOLUENE
PARA-PHENETIDINE
PARA-TOLUIDINE
PERI ACID
PHENYL-ALPHA-NAPHTHYLAMINE
PHENYL-BETA-NAPHTHYLAMINE
PHENYL GAMMA ACID
PHENYL-METHYL-PYRAZOLONE
PHENYL PERI ACID
PICRAMIC ACID
PICRIC ACID
RESORCINOL, TECHNICAL
R SALT
S ACID
SCHAEFFER SALT
SODIUM METANILATE
SODIUM NAPHTHIONATE
SODIUM PARA-NITROPHENOLATE
SODIUM PICRAMATE
STABILIZERS
SULFANILIC ACID
SULFUR DIOXIDE
THIOCARBANILIDE
TOLIDINE (BASE)
TRIBUTYLAMINE
ACID
DINITROTOLUENE
DINITROTOLUENE OIL
DI-ORTHO-TOLYLTHIOUREA
DIPHENYLAMINE
EPSILON ACID
ETHER
ETHYLACETANILIDE
ETHYL ALCOHOL
ETHYLBENZYLANILINE
FLOTATION REAGENTS
GAMMA ACID
G SALT
INHIBITORS
J ACID
KOCH ACID
L ACID
LAURENT'S ACID
METANILIC ACID
META-NITROANILINE
META-NITROTOLUENE
META-TOLUIDINE
META-XYLIDINE
DU PONT DE NEMOURS & COMPANY, INC.
Wilmington, Del.
"Better call Du Pont about that Dimethylamine"
"O.K.– their quality is as good as their Service!"

## FIRE RETARDANT COMPOSITION NO. 3 WG

A mixture of well-known inorganic fire retardant salts in optimum concentrations together with certain organic addition agents which afford the minimum change in textile physical properties of the treated material. Uses: to effectively flameproof textile and paper materials. The Grasselli Chemical Co., Inc.

## FIXALT

A modified chromium sulfate. A dry product, readily soluble in water. Uses: for the after treatment of dyed wool and cotton mixtures to prevent bleeding. Merrimac Chemical Co.

## FIXTAN A

A filling agent for heavy leathers. Has the advantage of fixing other fillers in the leather, thereby increasing the hide substance and securing a higher yield of salable leather. Also improves color brightness and color uniformity in the leather. The Grasselli Chemical Co., Inc.

## FIXTAN B

A filling agent for heavy leathers. Has the advantage of fixing other fillers in the leather, thereby increasing the hide substance and securing a higher yield of salable leather. Also improves color brightness and color uniformity in the leather. The Grasselli Chemical Co., Inc.

## FUNGICIDE NO. 66

A dark brown powder, soluble in water. A true organic fungicide containing no copper or lead salts. Gives excellent control of copper and sulfur responding fungi, while it is compatible with either of such fungicides. Has excellent wetting and spreading properties and is non-poisonous. National Aniline & Chemical Co., Inc.

## GLYCERYL MONORICINOLEATE

The ricinoleic acid ester of glycerin. An amber colored, oily liquid of fair viscosity. Emulsifiable in water; sol. alcohol and light hydrocarbons. Non-drying. Uses: emulsifying agent; plasticizer. Glyco Products Co., Inc.

## GLYCERYL MONOSTEARATE

A cream-colored wax, dispersible in water. M. P. 58-60° C. Uses: thickening and emulsifying agent for use in cosmetics, pharmaceutical ointments, etc. Glyco Products Co., Inc.

## GRASSELLI SS3

A combined spreading and sticking agent used with fungicides, insecticides and other sprays to assist the wetting, spreading, and adhesive properties of such sprays. This product is compatible with hard water and most spray compounds. The Grasselli Chemical Co., Inc.

## GUM KARAYA—GRANULAR

ISCO Brand. Made to specifications, free bark removed and foreign material extracted. Uses: principally as a base in the new laxatives. Innis, Speiden & Co.

## GUM KARAYA, POWDER—SUPERFINE

ISCO Brand. A white powder made from selected sorts, cleaned from free bark and ground to a uniform fineness. Uses: in colorless wave set concentrates and dentrifices. Innis, Speiden & Co.

## HERCOSE C

Protective-coating base. Uses: makes possible new type of lacquers that will not discolor or disintegrate in the sun, will not absorb moisture, and are non-flammable, producing clear, flexible, tough, adhesive films. Suggested for cable coatings; covering porous surfaces; airplane and balloon dopes; bronzing lacquers; silver lacquers; and over-coating. Hercules Powder Co.

## HYDROXYLAMINE BENZOATE

AMECCO Brand. $NH_2OH.C_6H_5COOH$. Mol. wt. 155.08. White, microcrystalline powder, slight odor benzoic acid. Very sol. water, alcohol. Uses: as reducing agent; antiseptic; preservative and oxidation inhibitor fatty acids and soaps. American Chemical Products Co.

## IRON CHLORIDE, LUMP, 60%

ISCO Brand. During the past year this product has been developed to a very high standard. It makes a quick solution, free from sediment, and is meeting with ready favor because of its low price, solubility, and saving on freight as compared to the solution. Innis, Speiden & Co.

## KILFOAM

Chiefly high boiling alcohol. Colorless liquid, having mild odor. B. P. about 178°F. Volatile with steam. Non-corrosive. Insol. water; sol. alcohol, ether, organic solvents. Uses: powerful foam reducing agent. American Chemical Products Co.

## KODALK

A new alkali that is less alkaline than carbonate and more alkaline than borax and superior to both. Has the following advantages in recommended developers: (1) Permits ready adjustment of developer activity; (2) Blister troubles are eliminated; (3) Greatly reduces sludging tendency of many fixing baths; (4) Dissolves quickly without caking; (5) Keeps satisfactorily when stored in covered containers. Eastman Kodak Co.

## LECITHIN HYDRATE—AQUALOID

The oil-soluble colloid vegetable lecithin in new physical form, with many new uses and greatly extended physical properties. Molecular dispersion of this useful phosphatid in water has resulted in higher efficiency as an emulsifier, increased penetration and wetting properties, and maximum ease of dispersion. (U. S. and foreign product and process patents pending.) Jungmann & Co., Inc.

## LITHOFORM

Solves the old problem of making paint stick to galvanized iron. Applied to galvanized structures by brushing or spraying, thus converting surface to a phosphate. This surface will not crack or corrode, is not affected by baking temperatures, and takes paint perfectly. Product is designed to cover approx. 1000 sq. ft. per gal. American Chemical Paint Co.

## LORO

A synthetic contact insecticide containing Lorol Rhodanate as the active ingredient. Especially effective for the control of red spider, mites, thrips, mealy bugs, aphids and other sucking insects. The Grasselli Chemical Co., Inc.

## MAGONE

A white, amorphous powder. Sol. water, hydrocarbons, alcohol. Prevents formation insoluble soaps; normalizes hard water. Gives interesting products in combination with soaps and sulfonated oils. Of interest for treatment water to be used in emulsions. Uses: degumming cotton, rayon, silk; boiler and bottle washing compounds; special detergents; washing beer barrels; sudless soap compounds for washing fine silks, etc.; clarifying shampoos and liquid soaps. Useful in cosmetics because of high emulsifying power. The Beacon Co.

## MANGANESE NITRATE

A solution of 20% manganese nitrate, anhydrous basis, is used in a patented rustproofing composition. Its advantages lie in the increased speed of rustproofing as compared with earlier materials used for this purpose. The Grasselli Chemical Co., Inc.

## MERTANOL

A synthetic tanning material. Sample represents material as shipped in commercial practice; *i.e.*, a slightly acid water solution. Product sets high standard for materials of this type in that it has good color, is free from harmful acidity, aids in level fixation of acid dyestuffs used for tinting, and has good fastness to light. Uses: particularly useful in manufacture of whites from chrome tanned leather. Merrimac Chemical Co.

## META-CRESOL—70-75%

Uses: for the manufacture of derivatives of meta-cresol and in place of regular meta-para cresol where a higher content of meta-cresol than is customary is desired. Available in two grades: (1) containing ortho-cresol in small amounts and (2) substantially free from ortho-cresol. The Barrett Co.

## META-CRESOL—80-85%

Uses: for the manufacture of derivatives of meta-cresol. The Barrett Co.

## META HYDROXY BENZOIC ACID

A white, odorless, crystalline powder. M. P. 201°C. Solubility in water at 20°C. approx. 1-120; in alcohol at 20°C. approx. 1-2. Uses: as a germicide, antiseptic, and preservative; in organic synthesis. Heyden Chemical Corp.

## META METHYL BENZALDEHYDE

(Meta Tolyl Aldehyde.) A white, colorless liquid, having an odor similar to benzaldehyde, but somewhat more like sweet almond. B. P. 203.4°C. Sp. Gr. 1.08 at 25°C. Assay 97-98½%. Uses: in organic synthesis and in perfumery. Heyden Chemical Corp.

## METHYL ACETOACETATE

This product may react as an ester, ketone or alcohol, so becoming a fruitful means of synthesizing numerous derivatives such as dyestuff intermediates, pharmaceuticals, and special chemicals. Has lowest molecular wt. of any homologous ester, fewer pounds being required to yield a given wt. of end product. Carbide & Carbon Chemicals Corp.

## METHYL CELLULOSE

Cellulose ester. Greaseproof, flavor-retaining, non-flammable film; unaffected by organic acids. Uses: emulsifying agent for oils, waxes, and fats; thickener, binder, and adhesive in solution form. Hercules Powder Co.

## METHYL FORMATE

$HCOO.CH_3$. Water-white, volatile liquid; pleasant, ethereal, non-residual odor. Sp. Gr. 0.950-0.980 at 20/20°C. Purity 95-100% ester by wt. Distillation Range 31.5-35.0°C. Flash Point —32°C. (—25.6°F.). Uses: powerful fumigant and larvicide, particularly suitable for treatment of tobacco, dried fruits, cereals, and similar products; is readily flammable but fire hazard can be completely removed by using the ester in combination with carbon dioxide. Commercial Solvents Corp.

## METHYL LACTATE

$C_3H_5O_3.CH_3$. Water-white liquid evaporating about 70% as fast as butanol. Sp. Gr. 1.087-1.097 at 20/20°C. Purity not less than 95% ester by wt. Acidity less than 0.15% by wt., calculated as lactic acid. Distillation range 115-155°C. with not less than 60% distilling between 141-145°C. Uses: a noteworthy addition to the list of cellulose acetate solvents due to its high tolerance for diluents and its excellent flow-promoting and blush-resisting characteristics. Commercial Solvents Corp.

## METHYL MONO CHLOR PARA-HYDROXY BENZOATE

A white, crystalline powder. M. P. 107°C. Solubility in boiling water approx. 1-140; in water at 20°C. approx. 1-2000; in alcohol at 20°C. approx. 1-1. Uses: as a germicide, antiseptic, and preservative. Heyden Chemical Corp.

## METHYL N-AMYL KETONE

Stable, colorless, medium boiling ketone. B. P. 151° C. Misc. with usual lacquer solvents; only very slightly sol. water. Toluol dilution ratio 3.9 with half-second nitrocellulose. Uses: solvent for nitrocellulose as well as resins ordinarily used in lacquers, imparting excellent blush resistance. Particularly useful in synthetic resin finishes such as the "Glyptal" and "Vinyloid" types. Carbide & Carbon Chemicals Corp.

## METHYL PARASEPT

(Methyl Para Hydroxy Benzoate.) A white, crystalline powder, odorless, practically tasteless, and non-toxic. M. P. 126°C. Solubility in boiling water approx. 1-20; in water at 20° 1-400; in alcohol 1-25; in oils and fats 1-40. Uses: as a general preservative and anti-oxidant, especially in the drug and cosmetic fields. Heyden Chemical Corp.

## METSO 22

A special integral combination including sodium metasilicate. Flows freely and is resistant to caking. Dissolves in hot or cold water, quickly emulsifying mineral oils and greases. Uses: particularly effective for general clean-

ing; has been used in dairies, packing plants, and for maintenance cleaning in hotels, institutions, restaurants, etc. Philadelphia Quartz Co.

### METSO 66

New metasilicate cleaner for metals of all kinds. Easily and rapidly soluble. Special emulsifying ingredient gives increased efficiency; also makes it very convenient for metal working plants, eliminating additions of soap or rosin which are often necessary when basic alkalies are used. Uses: for the plater and enameler under actual plant conditions. Philadelphia Quartz Co.

### METSO 99

Sodium Sesquisilicate—U. S. P. 1,948,730. Contains approx. 36.89% alkali ($Na_2O$), 23.83% silica ($SiO_2$), 39.2% water ($H_2O$). Free-flowing; dissolves in water with only slightly positive heat of solution. At concentration of 0.1% by weight, produces pH of 11.6. Shares with other silicates properties of (1) maintenance of pH until nearly all the alkali is neutralized, (2) inhibiting power necessary in cleaners, (3) free rinsing. Uses: where stronger alkali than metasilicate is needed. Principal applications: cleaning where high pH is required. Philadelphia Quartz Co.

### MILDUCIDOIL

A permanent, non-volatile, non-poisonous, effective mildew preventive for use on textiles, ropes, leather goods and similar materials. Is a concentrated solution of a powerful fungicide; applied by diluting with a suitable organic solvent such as gasoline, benzol, carbon tetrachloride, etc., then saturating article to be proofed. Also, an effective one bath treatment for articles not subject to dry cleaning. Wolff-Alport Chemical Corp.

### MONO CHLOR PARA HYDROXY BENZOIC ACID

A white or yellowish powder. M. P. 107°C. Sol. alcohol, oils; insol. water. Uses: as a germicide, disinfectant, preservative; in organic synthesis. Heyden Chemical Corp.

### MURIATE OF POTASH—50-52% $K_2O$

Potassium chloride 80-83%. Processed muriate of potash. Uses: as fertilizer. United States Potash Company, Inc.

### MURIATE OF POTASH—62-63% $K_2O$

Potassium chloride 98.5-99.5%. A high grade, clean, white, refined product. Uses: as fertilizer; in chemical manufacture. United States Potash Company, Inc.

### MURODINE

Makes the acid treatment of sluggish oil wells safe. As little as .2% added to the well treating acid prevents the acid from attacking the well tubing and casting, eliminates hydrogen embrittlement of rods and cables, and makes the treatment more effective by delivering the full strength charge to the oil-bearing strata. American Chemical Paint Co.

### NACAN

A light brown solid. Uses: a mild oxidizing agent for prevention of "marking off" during the "boil off" of vat colors on fancy fabrics such as ginghams, chambrays, etc. National Aniline & Chemical Co., Inc.

### NACCOLENE F PASTE

A dry cleaning soap in paste form, applicable in standard dry cleaning equipment. Useful in very dilute concentrations, non-pressure building on filters, no rancidity, contains no fats, minimizes hand spotting operation. A definite organic compound especially prepared for this purpose. National Aniline & Chemical Co., Inc.

### NACCONOL E

A light brown powder, similar chemically to Nacconol KP, especially useful in removing lead spray residue in fruit washing and as an emulsifier for insecticides. National Aniline & Chemical Co., Inc.

### NACCONOL KP

A light colored, flaky solid; a sulfonated derivative of synthetic compounds of oily or fatty character; possessing great stability to acids, alkalies and hard water, exerting remarkable surface tension lowering in dilute solution and having unusual detergent and emulsifying properties. National Aniline & Chemical Co., Inc.

### NACCONOL KPR

A refined type of Nacconol KP, especially useful in textile processing on account of its wetting, penetrating and detergent properties. Quite unaffected generally by the presence of hard water, acid or alkali; an excellent power laundry, household detergent; also for use as an accelerant and intensifier in soap and soap powders. National Aniline & Chemical Co., Inc.

### NACCONOL MK

A white, solid cleaning compound of the Nacconol KP type, especially prepared for glass cleaning. National Aniline & Chemical Co., Inc.

### NACCOSOL A

A light brownish powder, somewhat hygroscopic, readily soluble in water. Especially useful as a wetting-out agent in textile processing. Unaffected by dilute acids, dilute alkalies, and hard water. National Aniline & Chemical Co., Inc.

### NACCOSOL PF

A brown liquid. Uses: for dustless impregnation of paper maker's felts. National Aniline & Chemical Co., Inc.

### NAPHTHALENE PASTE

An insecticide developed for use in control of chinch bugs. The Barrett Co.

### NAPHTHENIC ACID SLUDGE AND NAPHTHENIC SOAP

Specifications of E grade: Water 4-6%; ash 14-16%; oil 28-30%; naphthenic acid 46-54%. Uses: in textile oil emulsions. S. Schwabacher & Co., Inc.

### NEVINOL

An inert, fairly viscous plasticizing oil of very light straw color. Insol. in water. Imparts unusual chemical resistance, protecting against alkalies, dilute acids, and brine. Uses: in chlorinated rubber coatings, adhesives, rubber resin finishes, aluminum pastes, and other products requiring an unsaponifiable, neutral, substantially non-drying oil. The Neville Co.

### NICKEL DIMETHYLGLYOXIME

AMECCO Brand. $Ni[CH_3)_2(CNO)_2H]_2$. Scarlet red powder. Mol. wt. 288.83. Sublimes at 250°F. Insol. water, acetic acid, ammonia; sol. absolute alcohol, acids. Uses: pigment; sunfast color; also for paints, lacquers, cellulose compounds, and cosmetics. American Chemical Products Co.

### NITRAMON

A superior blasting agent having distinct and important advantages over the usual types of explosives used for quarrying and stripping operations. It is waterproof; will not freeze; will not cause headaches; loads more quickly than explosives; and when subjected to usual tests applied to explosives, it cannot be detonated by the strongest commercial blasting cap—by Cordeau—by flame—friction—or by impact. E. I. du Pont de Nemours & Co., Inc.

### NITROCELLULOSE LACQUER

An adaptation of nitrocellulose lacquers to paper, cardboard and packages of far-reaching importance. Uses: protects paper and cardboard cartons against moisture, fats, oils, acids, alkalies, smudges, tackiness, and discoloration. Hercules Powder Co.

### NITROCELLULOSE LACQUER EMULSIONS

Patented method making nitrocellulose lacquers emulsified in water. Uses: reduces lacquer cost, permitting application of a film of high solids content. Especially adapted for porous surfaces, *e.g.* papers and textiles; and has possibilities for use in adhesives, wood finishing, finishing metal surfaces, and for architectural and structural materials. Hercules Powder Co.

### NOVONACCO

A light brown solid. Uses: as a penetrating and wetting agent for textile processing in circulating machines. National Aniline & Chemical Co., Inc.

### OCTYL ACETATE

(2-Ethyl Hexyl Acetate)—Stable ester. B. P. 199.3° C. Has high solvent power for nitrocellulose and resins in comparison with other high boiling solvents. Uses: in brushing and dipping lacquers, mist coats, baking finishes; in nitrocellulose lacquer emulsions, especially useful in formulating emulsions designed to give smooth films at high humidities, as part of solvent in lacquer phase before emulsification or added to finished emulsion as retarder. Carbide & Carbon Chemicals Corp.

### OCTYL ALCOHOL

(2-Ethyl Hexanol)—B. P. 184.6° C. Colorless, slightly viscous liquid; misc. most organic solvents; sol. water to extent of only 0.14% by wt. at 25° C. Uses: solvent for gums, waxes and resins, mineral, vegetable and animal oils; its esters as plasticizers for general application; mixed with various cresols forms excellent penetrants for mercerizing cotton. Has marked anti-foam powers. Carbide & Carbon Chemicals Corp.

### OCTYL ALDEHYDE

(2-Ethyl Hexanal)—Colorless, high boiling aldehyde. B. P. 163.4° C. Mild, characteristic odor. Only slightly sol. water; misc. with most common organic solvents. Uses: in chemical synthesis where an aldehyde having its particular properties is required. Characteristic odor makes it useful in preparation of perfumes. Carbide & Carbon Chemicals Corp.

### OILS, MINERAL—FLAG BRAND

Genuine Russian white mineral oils U. S. P. (Liquid Petrolatum). Seven grades from Extra Light to Extra Heavy. Refined from genuine Russian crude oil. Sp. Gr. .860-.890. Viscosity 80-345. Uses: as internal lubricant, either straight or compounded with agar or similar products; for various pharmaceutical or cosmetic purposes. S. Schwabacher & Co., Inc.

### OILS, MINERAL—FLAG BRAND

Technical white mineral oil for industrial purposes. Sp. Gr. 80-90. Viscosity 860-865. Cold Test —40°F. Uses: pharmaceutical; cosmetic; textile (silk, rayon); lampshades; lubricating fine machinery. S. Schwabacher & Co., Inc.

### OILS, REFRIGERATOR—FLAG BRAND

Sp. Gr. 880-900. Flash Point 365-395°F. Pour Point —25 to —40°F. Viscosities 165-400. Uses: as lubricants in compressors of refrigerators or air conditioning apparatus. S. Schwabacher & Co., Inc.

### ORANGE 3RC

CALCONESE Brand. Produces a shade of very good brightness on acetate slightly on the red tone. Is especially recommended as a component for making up numerous shades of brown, and discharges to a clean white with a suitable hydrosulfite. Is also supplied in double strength form. The Calco Chemical Co., Inc.

### ORTHO BENZYL PHENOL

A colorless liquid. B. P. 144° at 1 mm., 307° at 760 mm. M. P. about 20°C. Sol. most organic solvents, dilute alkalies; insol. water. Uses: as a disinfectant; in organic synthesis. Heyden Chemical Corp.

### ORTHO PHENYL TOLYL KETONE

A pale yellow, oily liquid, having slight aromatic odor. M. P. Below —18°C. B. P. 316°C. Insol. water; readily sol. alcohol, most organic solvents, and oils of high stability; and affected by only strong reducing or oxidizing agents. Uses: as a fixative in perfumery. Heyden Chemical Corp.

## OXYLIN

A glycerin substitute for many industries. Slightly hygroscopic and light in color; miscible water, alcohol; immiscible benzol-acetone, gasoline; solvent for many organic compounds. Uses: cosmetics; photographic emulsions; special lubricants; rubber stamps; inks; softening agent textiles; solvents for printing and dyeing textiles; parchmentizing and waterproofing paper, etc. The Beacon Co.

## PARA BENZYL PHENOL

A white, crystalline powder, of faint characteristic odor. M. P. 83°C. B. P. 313°C. Very slightly sol. water; readily sol. alcohol, most organic solvents, and dilute alkalies. Uses: as a germicide, preservative, and antiseptic; in organic synthesis. Heyden Chemical Corp.

## PARA-CHLOR-ANILINE

Purity min. 98%. M. P. 69°C. Sol. organic solvents, aqueous hydrochloric acid; insol. water. Uses: as dye intermediate. Verona Chemical Co.

## PARA-CHLOR-META-CRESOL

A highly refined chemical. Uses: in manufacture of antiseptics; as a preventative of mold formation. The Barrett Co.

## PARA-CHLOR-META-XYLENOL

Uses: in manufacture of antiseptics; as preventative of mold formation; has a higher bacteriacidal coefficient than para-chlor-meta-cresol. The Barrett Co.

## PARA-CHLOR-ORTHO-ANISIDINE

Purity min. 98%. M. P. 81°C. Sol. organic solvents, aqueous hydrochloric acid; insol. water. Uses: as dye intermediate. Verona Chemical Co.

## PARA-CHLOR-ORTHO-NITRANILINE

Purity min. 99%. M. P. 116°C. Sol. organic solvents, aqueous hydrochloric acid; insol. water. Verona Chemical Co.

## PARA-CHLOR-ORTHO-NITRO-PHENOL

Purity min. 99%. M. P. 86°C. Sol. organic solvents, aqueous caustic soda; insol. water. Uses: as dye intermediate; pharmaceutical intermediate (as for mercurials). Verona Chemical Co.

## PARA-CRESOL—85%

M. P. 24°C. Uses: for the manufacture of oil resins of the phenol-formaldehyde type. The Barrett Co.

## PARA-CRESOL—90%

Uses: for the manufacture of oil soluble resins of the phenol-formaldehyde type. The Barrett Co.

## PARA-CRESOL—98-99%

M. P. 32-34°C. (dry). Uses: for the manufacture of dyes and fine chemicals. The Barrett Co.

## PARA-HYDROXY BENZOIC ACID

A light, buff colored powder. M. P. 213°C. Solubility in water at 20° approx. 1-200; in alcohol at 20° approx. 1-2.5. Insoluble in benzol. Uses: as a germicide and preservative; in organic synthesis. Heyden Chemical Corp.

## PARA PHENYL TOLYL KETONE

White mono clinic crystals, having mild aromatic odor. M. P. 60°C. B P. 326°C. Insol. water; sol. alcohol, most organic solvents and oils of high stability; and affected by only strong reducing or oxidizing agents. Uses: as a fixative in perfumery. Heyden Chemical Corp.

## PAROIL

Chlorinated paraffins. Several grades containing different percentages of chlorine. Pale to amber neutral light or viscous oils. Soft wax. Inert; odorless; tasteless; flame-resistant. Sp. Gr. .900-1.50. Uses: medicinal industrial purposes; as plasticizing agent; softening agent flame retardant oil; soldering flux. American Chemical Products Co.

## PELLET D

Black blasting powder. A new type of black powder in pellet form, which gives off less fumes than other types of black powder and has other desirable advantages. Hercules Powder Co.

## PENTAERYTHRITOL

$C(CH_2OH)_4$. White, odorless crystals. Sp. Gr. 1.34. Sol. water; slightly sol. alcohol; insol. benzene, carbon tetrachloride, ether, petroleum ether. M. P.-C. P. grade 250-255° C., Technical 230-240° C. Uses: plasticizer for cellulose ester lacquers, synthetic resin products; manufacture detonator compounds. Niacet Chemicals Corp.

## PHENOTHIAZINE

A new organic stomach insecticide which is comparatively non-poisonous to warm blooded animals. This product has proved to be highly effective for the control of codling moth, Mexican bean beetle, Colorado potato beetle and many other chewing insects. The Grasselli Chemical Co., Inc.

## PICKLING COMPOUND NO. 91

A highly efficient inhibitor made from coal tar bases, for use in pickling steel. The Barrett Co.

## PICKLING COMPOUND NO. 93

A less purified but somewhat more efficient compound than No. 91, suitable for use in acid treatment of oil wells. The Barrett Co.

## POTASH MANURE SALTS—SYLVINITE-CRUDE

Potassium chloride 25-26% $K_2O$. Clean, granular, free-flowing crude potash salts mined and crushed for the fertilizer trade. Uses: as fertilizer. United States Potash Company, Inc.

## POTASSIUM CHROMATE

An exceptionally pure, technical grade testing 99.9% $K_2CrO4$. It is especially low in chlorides and sulfate and contains no free alkali. Mutual Chemical Co. of America.

## PROPYL PARASEPT

(Propyl Para-Hydroxy Benzoate.) A white, crystalline powder, odorless, practically tasteless, and non-toxic. M. P. 97°C. Solubility in water at 100°C. approx. 1-325; in water at 20°C. approx. 1-2000; in alcohol at 20°C. 1-2. Uses: as a preservative and anti-oxidant. Heyden Chemical Corp.

## PRO-TEK

A form of "vanishing cream" which, when rubbed on the hands and arms covers them with an invisible film which prevents paste, grime, grease, lacquer, and other chemicals from entering the pores and adhering to the skin. It is not a soap and is used before the hands get dirty. Can be removed simply by washing with soap in running water. This dissolves the protective film and carries away the dirt and grime, leaving the hands clean and healthy. E. I. du Pont de Nemours & Co., Inc.

## PYRITES

Contains approximately 42% iron and from 48 to 50% sulfur. Uses: in manufacture of sulfuric acid. This pyrites is mined by The Mountain Copper Co., Ltd., in Shasta County, California. New product with this company.

## PYRROLE

2, 4-Dimethyl-3, 5-diethyl dicarboxy pyrrole, Mol. wt. 239. Sol. acetic acid, alcohol; insol. water. Extremely stable and resistant to chemical action. Uses: synthesis of dyes; preparation pyrrole acid. American Chemical Products Co.

## RED 2BC

CALCONESE Brand. Produces a shade of good brightness and noticeably bluer than Calconese Red YC. Its uses and general all round properties are similar to the Red YC. The Calco Chemical Co., Inc.

## RED VIOLET RY

CALCONESE Brand. Produces a very brilliant yellow tone violet. Has excellent light fastness and very good resistance to water, perspiration, acid, and washing. Its chief use is in the production of mode shades and as a base for the production of a range of shades such as Heliotropes. The Calco Chemical Co., Inc.

## RED YC

CALCONESE Brand. Produces on acetate a bright red of a yellower tone than Calconese Red 2BC. May be used as a self shade and also in combination for brown, crimson and wine shades or whenever a bright red is needed as a shading color. Has very good fastness to dry cleaning, crocking, light, hot pressing, and is readily dischargeable. The Calco Chemical Co., Inc.

## REZYL 11H

A water-white alkyd resin representing a lacquer type of Rezyl Resin which has been made for many years, but recently vastly improved in color through development of new equipment and manufacturing technique. Original color has not only been improved so that it is nearly water-white, but tendency toward after-yellowing on ageing has been practically eliminated. Uses: for paper coating lacquers. American Cyanamid & Chemical Corp.

## REZYL 19 SOLUTION

A lacquer type alkyd resin of superior color and durability which has been made for many years but recently vastly improved in color through development of new equipment and manufacturing technique. Original color has not only been improved so that it is nearly water-white, but tendency toward after-yellowing on ageing has been practically eliminated. American Cyanamid & Chemical Corp.

## REZYL 387-2

A solution of an oxidizing type alkyd resin. Has not only extremely pale original color but excellent retention of color on baking or ageing of the film being, in this respect, superior to oxidizing type alkyd resins previously available. Uses: in white enamels to bake at relatively low temperatures. American Cyanamid & Chemical Corp.

## REZYL 1043 SOLUTION

An oxidizing type alkyd resin to bake very quickly at relatively low heats, at the same time imparting to the finish the necessary characteristics of high gloss, extreme hardness, distensibility, and outdoor durability. Uses: for fast baking auto enamels. Being extremely pale in color, it is adapted for use in white enamels for many purposes. American Cyanamid & Chemical Corp.

## RH-35

A colorless, transparent, practically odorless hydrocarbon resin with high refractive index, which is quite resistant to heat, acids, and strong alkalies. Soluble in many petroleum and chlorinated hydrocarbons and all types of organic solvents except lower alcohols. Various materials can be blended with it to give compositions which have new and useful properties. E. I. du Pont de Nemours & Co., Inc.

## SCARLET GC

CALCONESE Brand. Produces on acetate a yellow toned scarlet of very good brightness. Has excellent dispersibility and excellent fastness to dry cleaning, wet or dry rubbing, and hot pressing. The Calco Chemical Co., Inc.

## SODA ASH—TRONA

During the processing of brine at Searles Lake, California, a double salt, sodium carbonate-sulfate is boiled out of solution along with some free sodium carbonate and sodium chloride. By a unique physio-chemical process, the mixture is separated into its component

parts, producing soda ash containing minimum 99.5% $Na_2CO_3$. Cumulative screen analysis:

| | |
|---|---|
| + 20 Mesh | .6 |
| + 30 Mesh | 1.8 |
| + 40 Mesh | 12.3 |
| + 50 Mesh | 35.0 |
| + 60 Mesh | 56.6 |
| + 80 Mesh | 78.1 |
| + 100 Mesh | 89.8 |
| + 200 Mesh | 98.8 |
| — 200 Mesh | 1.2 |

American Potash & Chemical Corp.

### SODIUM LACTATE SOLUTION

A 75% solution of sodium lactate. Uses: chief to date is as a corrosion inhibitor in alcohol anti-freeze. The Grasselli Chemical Co., Inc.

### SODIUM-LEAD ALLOY

Comprises 2% metallic sodium and 98% base metal. Uses: in applications where the lead addition is more easily tolerated than the zinc; as de-oxidizer in brasses and bronzes. An overdose of the material will not injure the mechanical or chemical properties of the non-ferrous alloy being produced. A considerable degree of refinement is afforded due to the violent boiling and stirring action which takes place when it is added to the bath. The Grasselli Chemical Co., Inc.

### SODIUM SULFATE—DESICCATED

TRONA Brand. During the processing of brine at Searles Lake, California, a double salt, sodium carbonate-sulfate is boiled out of solution along with some free sodium carbonate and sodium chloride. By a unique physio-chemical process, the mixture is separated into its component parts, producing a series of sodium sulfate products of which desiccated sodium sulfate, free from calcium and magnesium, is useful in the textile dyeing industry. Density 87.3. Analysis:

| | |
|---|---|
| $Na_2SO_4$ | 99.63 |
| $Na_2CO_3$ | .24 |
| NaCl | .07 |
| $H_2O$ | .06 |
| Fe | .0016 |
| Insol. ex of Fe. | .0032 |

American Potash & Chemical Corp.

### SODIUM-ZINC ALLOY

Comprises 2% metallic sodium and 98% base metal. Is more universally applicable than the Sodium-Lead Alloy. Uses: as de-oxidizer in brasses and bronzes. An overdose of the material will not injure the mechanical or chemical properties of the non-ferrous alloy being produced. A considerable degree of refinement is afforded due to the violent boiling and stirring action which takes place when it is added to the bath. The Grasselli Chemical Co.

### STEARITE—WITCO

A synthetic stearic acid produced by the selective hydrogenation of unsaturated oils. By this process, it is possible to control the ratio of various fatty acids so that the final product may be produced uniform with any given specifications. Uses: to replace animal stearic acid in rubber compounds, plater's polishing compounds, varnish manufacture, etc. Wishnick-Tumpeer, Inc.

### STRIPPLE

For removing paint from all types of steel structures before repainting. Product is applied to the surface from which the paint is to be removed, permitted to stand for 24-48 hours, then washed off by spraying with water. No mechanical work is required. One application is usually sufficient to remove all paint. American Chemical Paint Co.

### SUCROSE OCTA ACETATE

Trade Mark SOA—$C_{28}H_{38}O_{19}$. White, odorless, crystalline solid, very bitter taste. Sp. Gr. (fused) 1.28. M. P. 80-84° C. B. P. 280° C. at 0.1 mm. Hg. Very sol. acetone, toluene, ethylene dichloride; sol. ethanol, carbon tetrachloride, and most other organic solvents; practically insol. water. Uses: denaturant rubbing alcohol; plasticizer cellulose acetate and nitrate lacquers, synthetic resins; anhydrous adhesive; transparentizing agent for paper products. Niacet Chemicals Corp.

### SUPER PHOSPHATE—'AERO'

32% Granular. Carries twice as much plant food (phosphoric acid) as ordinary superphosphate, requiring, in handling, only half as many bags. Supplied in free-flowing pellets, making it easy to handle and apply. Has no tendency to cake on standing and can be applied with any ordinary fertilizer distributor. Its phosphoric acid stays in available form longer in the soil. American Cyanamid & Chemical Corp.

### SUPERTEX No. 100

Highly specialized vegetable gum, prepared by a special, patented process. Contains no starch, dextrine, or material of such nature. Made entirely from natural gums refined; all bark, dirt, etc., being removed. Uses: being so purified and clarified, it suspends dyestuffs and hydrosulfites in a much more finely divided state. Jacques Wolf & Co.

### TANAK

A synthetic tanning material useful as a mordant for chrome leather when extremely light shades are desired. It is a very valuable adjunct to the two-bath chrome tanning method. Especially adaptable for producing white chrome leathers, and prevents oxidation of white leather when used according to formulas supplied. American Cyanamid & Chemical Corp.

### Tegul-MINERALEAD

Compounded especially for joining bell and spigot pipe. In addition to meeting a demand for a jointing compound which is free from initial leakage, or practically so, it has greater resistance to mechanical and thermal shock, greater plasticity and a lower coefficient of expansion than sulfur cements heretofore used in pipe jointing practice. Manufactured by Atlas Mineral Products Co. A patented product developed through research activities of Texas Gulf Sulphur Co. at Mellon Institute of Industrial Research.

### Tegul-VITROBOND

An acid-proof cement having high tensile strength and high resistance to mechanical and thermal shock. Uses: for jointing brickwork and tile in construction pickling tanks, electrolytic cells, sewers, floors, and other structures subject to severe deterioration by acid. Manufacturer, Atlas Mineral Products Co., supplies engineering service regarding its use. A patented product developed through research activities of Texas Gulf Sulphur Co. at Mellon Institute of Industrial Research.

### 4.4' TETRAMETHYLDIAMINO-4"-HYDROXYTRIPHENYLMETHANE

$C_{23}H_{26}N_2O$. M. P. 161-163°C. One of a group of the leuco forms of dyes valuable in the study of oxidation-reduction reactions. Eastman Kodak Co.

### THIODYPHENYLAMINE

(See Phenothiazine.)

### THERMOFLEX A

An antioxidant especially effective for the prevention of flex-cracking; a failure resulting from repeated rapid stretching or bending of rubber which gives rise to splitting. A dark gray pwdr.; chemically a mixture of secondary aromatic amines. Sp. Gr. 1.20. Has excellent stability, and is non-toxic when used in amounts recommended. Dispersion in rubber is excellent, as it fluxes and softens under 50°C. E. I. du Pont de Nemours & Co., Inc.

### THREE ELEPHANT METBOR*

An alkaline borate compound having a much higher solubility than borax. Developed primarily for use in solutions to clean and to control decay of citrus fruit. Preliminary tests indicate that it may be equally useful for many other fungicidal and detergent purposes American Potash & Chemical Corp.

* *Trade Mark Reg. U. S. Pat. Off.*

### TIN TETRACHLORIDE

Manufactured by a special, patented process. Is white, transparent and has low antimony content. Uses: particularly made for weighting pure silk yarn and cloth. Jacques Wolf & Co.

### TORNESIT

A chlorinated rubber. New sprayable type (20-35 centipoises) has just been developed. Uses: base for chemically resistant protective coating. Hercules Powder Co.

### TRIACETINE C.P.

Water-white liquid, not more than 25°Hazen Scale. Boiling Range 259-262°C. at normal pressure, 131°C. at 7 mm. Sp. Gr. 1.165 at 15°C. Wt. 9.7 lbs. per gal. Acidity (as acetic) not more than 0.002% pH, not below 5.3. Sap. No. not less than 770. Ignition Point 160°C. Flash Point 150°C. Volatility 100% loss at end of 15 hrs. at 90°C. Hydrolysis with boiling water: one hr. = 0.65%, 3 hrs. = 2.06%. Solubility of water in triacetine 5.3% at 25°C. Solubility in water 9.17% at 20°C. Ref. Ind. 1.431 at 20°C. Non-toxic. A chemically pure and practically odorless triacetine available for the first time in commercial quantities. Uses: as a cellulose acetate plasticizer where high purity is needed. Interesting solvent and non-toxic properties make it adaptable in the pharmaceutical industries. Kessler Chemical Corp.

### TRIBUTYL CITRATE

$(CH_2COOC_4H_9)_2C(OH)COOC_4H_9$. Light straw-colored, non-volatile liquid. Sp. Gr. 1.044-1.047 at 20/20°C. B.P. approx. 233.5°C. at 22.5 mm. of mercury. Uses: lacquer plasticizer; very efficient anti-foam agent for water dispersions. Commercial Solvents Corp.

### TRIBUTYL CITRATE

Light straw liquid, approx. 125°Hazen Scale. Practically odorless to slightly fruity odor. Boiling range 210-226°C. at 7-9 mm. Sp. Gr. 1.045 at 20°/15.5°C. Wt. per gal. 8.7 lbs. at 20°C. Water content 0.1% maximum. Ester (as tributyl citrate) by saponification at least 99%. Acidity 0.03% maximum as citric acid. Freezing Pt. —17°C. to —22°C. Solubility in water 0.08% at 21°C.; in acetone: 1.20 clear. Solubility of water in tributyl citrate 0.75% at 21°C. Hydrolysis in boiling water 0.056% in 5½ hours. Flash Pt. 200°C. Fire Pt. 220°C. Dilution ratio for cellulose nitrate solution 1: 7.0 toluol as diluent. Uses: non-solvent plastizer for cellulose acetate; solvent for cellulose nitrate. Kessler Chemical Corp.

### TRIBUTYL PHOSPHATE

$(C_4H_9)_3PO_4$. A very stable liquid of low volatility. Sp. Gr. 0.9763 at 20/20°C. Flash Point 145°C. B.P. approx. 175°C. at 23 mm. of mercury. Uses: a super-high-boiling solvent for nitrocellulose lacquers, dopes, and inks; excellent plasticizer for Celluloid. Commercial Solvents Corp.

### TRI-CLENE—FABRIC CLEANER

A powerful, non-inflammable cleaning fluid used extensively by leading dry cleaners. It leaves no odor and does not shrink fabrics. Removes grease, wax, fresh paint, gum adhesive tape, etc. E. I. du Pont de Nemours & Co., Inc.

### ULTRA FINE GRAIN DEVELOPER

A new package developer which produces negatives of finest grain permitting extreme enlargements. Advantages are: (1) Non-staining; (2) Rapid rate of development; (3) Gives maximum shadow detail (double normal exposure for finest results); (4) Good keeping properties. Especially recommended for all negatives made with miniature cameras. Eastman Kodak Co.

### UREA, CRYSTAL

Produced from carbon dioxide and ammonia by synthesis at high pressure and high temperature. Urea is interesting historically because it was the first organic chemical synthesized from inorganic chemicals. Uses: as a fertilizer; also an essential ingredient of urea-formaldehyde resin, the basis of an important class of plastics. E. I. du Pont de Nemours & Co., Inc.

## URSULIN

A sulfonated, oriental vegetable oil adaptable as a fat liquor for white leather, due to the fact that it imparts no color to the leather and is a non-oxidizing oil. Uses: in tanning leathers of light color, particularly white leather. American Cyanamid & Chemical Corp.

## VAT PRINTING BROWN G POWDER

NATIONAL Brand. Vat printing powder which is instantly dispersible into the "printing gum." Remains unchanged indefinitely, instead of drying out, settling or freezing, thus assuring a closer check on actual shop consumption and a more positive adherence to established standards as successive patterns are returned for "repeats." Penetration is achieved to a degree not attained by other forms of vat colors. Fine lines and scroll work possess the same depth and density of color as do broad stripes and open work. National Aniline & Chemical Co., Inc.

## VAT PRINTING ORANGE R POWDER

NATIONAL Brand. Vat printing powder which is instantly dispersible into the "printing gum." Remains unchanged indefinitely, instead of drying out, settling or freezing, thus assuring a closer check on actual shop consumption and a more positive adherence to established standards as successive patterns are returned for "repeats." Penetration is achieved to a degree not attained by other forms of vat colors. Fine lines and scroll work possess the same depth and density of color as do broad stripes and open work. National Aniline & Chemical Co., Inc.

## VAT PRINTING PINK FF POWDER

NATIONAL Brand. Vat printing powder which is instantly dispersible into the "printing gum." Remains unchanged indefinitely, instead of drying out, settling or freezing, thus assuring a closer check on actual shop consumption and a more positive adherence to established standards as successive patterns are returned for "repeats." Penetration is achieved to a degree not attained by other forms of vat colors. Fine lines and scroll work possess the same depth and density of color as do broad stripes and open work. National Aniline & Chemical Co., Inc.

## VAT PRINTING RED VIOLET RH POWDER

NATIONAL Brand. Vat printing powder which is instantly dispersible into the "printing gum." Remains unchanged indefinitely, instead of drying out, settling or freezing, thus assuring a closer check on actual shop consumption and a more positive adherence to established standards as successive patterns are returned for "repeats." Penetration is achieved to a degree not attained by other forms of vat colors. Fine lines and scroll work possess the same depth and density of color as do broad stripes and open work. National Aniline & Chemical Co., Inc.

## VAT PRINTING SCARLET GGN POWDER

NATIONAL Brand. Vat printing powder which is instantly dispersible into the "printing gum." Remains unchanged indefinitely, instead of drying out, settling or freezing, thus assuring a closer check on actual shop consumption and a more positive adherence to established standards as successive patterns are returned for "repeats." Penetration is achieved to a degree not attained by other forms of vat colors. Fine lines and scroll work possess the same depth and density of color as do broad stripes and open work. National Aniline & Chemical Co., Inc.

## VATSOL

A wetting agent for accelerating removal of lead and arsenic residues from apples. Available in powder and paste forms, being added to the washing solution, whether solution is heated or used at normal temperatures. Insures satisfactory removal under most severe conditions by bringing cleaning solution into instantaneous contact with entire surface of fruit, without injury to the fruit. Also insures removal of residues to well below official tolerance limits. American Cyanamid & Chemical Corp.

## VINSOL

A new type of resin. Uses: in certain types of varnishes, lacquers, and other protective coatings; emulsifying agent for asphalt emulsions; to increase melting point and improve wearing qualities of coal-tar asphalts used in road paving; as a binder in foundry cores; ingredient in various thermoplastic compounds; in certain types of printing inks; for electrical insulation. Hercules Powder Co.

## VITAMIN CONCENTRATE

NOPCO B—135 Powder. A concentrate of Vitamins B ($B_1$) and G ($B_2$) extracted from brewers' yeast. This material contains 135 International B units and 100 Sherman G units per gram. Natural Oil Products Co., Inc.

## VITAMIN CONCENTRATE

NOPCO BF—135. A concentrate of Vitamins B ($B_1$) and G ($B_2$) extracted from brewers' yeast and adsorbed on Fullers earth. This material contains 135 International B units and 100 Sherman G units per gram. Natural Oil Products Co., Inc.

## VITAMIN CONCENTRATE

NOPCO B—135 Paste. A concentrate of Vitamins B ($B_1$) and G ($B_2$) extracted from brewers' yeast and with some residual moisture. This material contains 135 International B units and 100 Sherman G units per gram. Natural Oil Products Co., Inc.

## VIV

A non-inflammable Carnauba wax emulsion. Uses: self-polishing wax for use on linoleum, rubber, tile, asphalt, hardwood, composition, terrazzo, and marble floors. Polishes, renews, preserves, and seals surfaces on which it is used. Made by Paper Makers Chemical Corp., subsidiary of Hercules Powder Co.

## VOLCLAY BENTONITE

"Quick Dispersing." Can be dispersed in water twenty to fifty times as fast as the usual commercial powdered bentonite. Does not form clots. Requires less mixing machinery. Produces same gel and suspensions as standard powdered Volclay Bentonite and is chemically the same. American Colloid Co.

## WATERPROOF W-559

A blend of waxes in a highly dispersed form, combined with an insoluble aluminum compound which is deposited on the goods. Makes a stable, milky emulsion which gives exceptional results on all fibres—cotton, wool, rayon, or silk. Uses: to render all fabrics water shedding or completely water repellent. Jacques Wolf & Co.

## WAX, AMORPHOUS MINERAL

A product, white in color, with a high melting point, practically free from oil and moisture, tough, of controlled uniform quality. M.P. 160°F. Sap. Number approx. 1.0. Acid Number approx. .01. Texture is very pliable, and it does not crack as crystalline wax would fracture when cut. This feature makes it valuable for various purposes. S. Schwabacher & Co., Inc.

## WAX, BEES, YELLOW—EXTRA LIGHT REFINED

ISCO Brand. Made from choice crude. Not chemically treated, but thoroughly refined. Can be used to replace sun-bleached beeswax in many industries. Innis, Speiden & Co.

## WAX, CARNAUBA—REFINED

ISCO Brand. A clean product, made entirely from pure crude Carnauba wax. M. P. 184½°F. All objectionable foreign particles removed, thus suitably adapting it to wax floor polishes, shoe polishes, etc. Innis, Speiden & Co.

## WAX, CERESIN—ORANGE

ISCO Brand. A composition wax suitable for the requirements of shoe polish manufacturers. M. P. 140°F. Innis, Speiden & Co.

## WAX, CERESIN—WHITE, No. 375

ISCO Brand. A composition product which can be altered to suit varying needs of different industries. M. P. 150°F. Innis, Speiden & Co.

## WAX, CERESIN, YELLOW, No. 101

ISCO Brand. A composition of waxes, combined and blended to suit individual requirements. M. P. 162°F. Typical of different compositions that can be made to suit specific needs. Innis, Speiden & Co.

## WAX, COLLOY

A self-emulsifying synthetic wax. Disperses in water to form water wax emulsion, which dries bright to a high gloss, leaving hard, transparent film of great durability. Uses: bright drying floor waxes; textile and shoe polish emulsions; leather stains; shoe dressings; furniture polishes; sizing emulsions for paper; emulsions for waxing fruit; glossing emulsions for rubber, etc. The Beacon Co.

## WAX, VEGETABLE—REFINED

ISCO Brand. The ideal substitute for Carnauba. Not a synthetic product, but a natural vegetable wax, refined, cleaned, and dehydrated. M. P. 160°. Can displace 50% Carnauba wax in water-wax emulsions. Innis, Speiden & Co.

## WOOD TURPENTINE, STEAM DISTILLED

A pure spirits of turpentine, with a pleasing fragrance, distilled from the oleo-resin of the long leaf pine. Has a minimum of 94% distilling at 170°C. (A. S. T. M.). Uses: wherever a pure spirits of turpentine is needed. Hercules Powder Co.

## YELLOW GC

CALCONESE Brand. Produces a very bright neutral shade of yellow. Principally recommended in the production of combination shades where a cheap yellow is needed. It is fast to dry cleaning, crocking, hot pressing, and discharges to an excellent clean white. The Calco Chemical Co., Inc.

## YELLOW RC

CALCONESE Brand. Produces on acetate a noticeably redder shade than Calconese Yellow GC. Is useful as a self shade for a golden yellow and also in combination shades of tan and brown. Has excellent all round fastness properties and discharges to a clean white. The Calco Chemical Co., Inc.

## ZINC SULPHIDE—HERCULES

A white pigment, consisting of zinc sulphide of an exceptionally high degree of chemical purity, made possible by an entirely new process of manufacture. Uses: especially recommended to the paint, rubber, paper, etc., industries because of its exceptionally high whitening power, its ready dispersibility in various media, and its fastness to light. Hercules Powder Co.

# New Products and Processes

## A Digest of the Current Literature for the User of Chemicals

## Talc and Kaolin in Leather Manufacture

For many years talc, kaolin and other white mineral deposits have been used in the manufacture of leather. They lighten the color of the leather and give it a softer and smoother feel. They are often used in the oil wheel in the manufacture of sole leather and in the fat-liquor drum in the manufacture of white leathers. They are also used to impart a soft and velvety feel to suede leathers, buck, and chamois. The author of this article, Dr. John Arthur Wilson, *Hide and Leather*, Sept. 14, '35, p32, states attempts have been made recently to learn more about these materials, particularly the suitability of different products for use in leather manufacture. The best types were found to be those derived from kaolin, or China clay. Of the various types of kaolin, the best appears to be the English product, which is largely responsible for the high development of porcelain ware in England.

When English kaolin is subjected to a process of flotation it separates into two portions, 90 per cent. being found insoluble in water and particularly suitable for manufacture into porcelain; 10 per cent. remaining in colloidal dispersion in the water. This 10 per cent. constitutes what is known as colloidal clay.

Under a high-power microscope only the larger particles of clay can be seen and these have an average diameter less than 0.001 mm. With the ultra-microscope, myriads of exceedingly tiny particles can be observed, which evidently have diameters much smaller than the wave length of visible light. Compared to these minute particles, the spaces between the fibrils in the grain surface of leather are enormous in size. The particles of ordinary kaolin and other clays have sizes many times greater than those of colloidal clay.

The stability of suspensions of colloidal clay was compared with that of the so-called soluble clay, sometimes used by tanners. A 10-gram sample of each was shaken with 100 cc. of water and allowed to stand undisturbed for an hour, at the end of which time 78 per cent. of the sample of colloidal clay remained suspended in the water against only 4 per cent. for the soluble clay.

The colloidal clay and soluble clay are evidently both derived from forms of kaolin having similar chemical compositions: about 38 per cent. aluminum oxide and 44 per cent. silica along with small amounts of titanium, magnesium and calcium, and about 13 per cent. of matter driven off upon ignition. Physically, however, they are quite different, the particles of colloidal clay being very much smaller and much more stable in suspensions in water.

Bentonite, which is sometimes referred to as colloidal clay, differs from colloidal clay both in chemical composition and in physical properties. A sample analyzed in the writer's laboratories showed 20 per cent. aluminum oxide and 58 per cent. silica. It does not readily dissolve in water but swells to a jelly, and time and vigorous agitation are required to bring it into suspension with water. Its suspensions are very viscous, being too viscous to handle when the concentration rises above 6 per cent. In tests on sole leather, bentonite was not nearly so readily taken up by the leather as colloidal clay.

When one gram of material was dissolved in a liter of water, the following pH values were observed for the suspensions: colloidal clay 5.36, soluble clay 5.90, and bentonite 6.55. All are slightly acid, but the pH value of the colloidal clay dispersion approaches most nearly the isoelectric point of hide substance, which is about 5.0.

Colloidal clay owes its peculiar properties not only to the ultra-microscopic size of its particles and to the enormous surface exposed to the water per unit weight, but also to the peptizing ions at the surfaces of the particles which impart to them a negative electrical charge. All ordinary leathers carry positive electrical charges when in contact with water. These are capable of neutralizing the negative charges on the colloidal clay particles, bringing about a type of combination of the particles and the leather. In this respect its action on leather is similar to that of a fat-liquor. It differs, however, in that the use of increasing amounts of colloidal clay does not cause looseness of the leather but rather has a filling action that improves the looser parts of the leather. It is miscible with fat-liquor and is a valuable material to use in conjunction with it.

In the ordinary operation of the oil wheel in sole leather manufacture so little water is used that practically no free water is left in the drum when the stock is hauled out and all of the materials used are carried out with the leather. When colloidal clay is used in this way it is completely taken up along with the other materials. However, even in the presence of an excess of water, a considerable portion of colloidal clay leaves the water, penetrating the leather and combining with it. In one test the drum contained 100 parts of dry sole leather to 150 parts of water and 4 parts of colloidal clay. After drumming one hour, although there was a considerable amount of water left, 22.45 per cent. of the clay had penetrated the leather. Upon drying, the leather had a lighter color and was smoother and mellower in feel. When bentonite was used in the same way, only 3 per cent. of it was taken up by the leather.

The effect of colloidal clay upon colored chrome calf leather was tested by taking a skin before coloring and fat-liquoring and cutting it into sides along the line of the backbone. The left side was put through in the regular way. The right side was treated exactly the same except for the addition to the fat-liquor of 5 lbs. colloidal clay per 100 lbs. shaved weight of leather. Upon drying, the side treated with colloidal clay was lighter and much more uniform in color, the grain was finer and smoother, the leather had a softer and mellower feel, the flanks felt much fuller, and the leather set out better. Analysis showed that the leather had taken up 5.12 lbs. colloidal clay per 100 lbs. hide substance. Of this amount of clay, it was

found that only 7.8 per cent. could be leached out by washing in running water for 24 hours and 92.2 per cent. was firmly held by the leather. The clay-treated leather showed an area gain of 2.2 per cent.

This test was repeated with uncolored chrome calf to be made into whites. Upon drying, the clay-treated side not only had all of the advantages noted above for the colored calf, but was so nearly white as to require much less white in finishing.

The work done to date shows clearly that colloidal clay can be used to real advantage in the manufacture of leather.

## *Miscellaneous*

### New Plastic Materials

A mechanism for economically and efficiently lining pipe with hot bituminous enamels has been invented by the engineering department of General Paint Corp., of Tulsa, Okla. Pipe so lined is widely used for water pipe lines. Company now is in position to treat both interior and exterior surfaces of pipe in practically one operation.

Produced as a by-product for many years, a plastic material, Sam-Bal, was used in the manufacture of ceramics, where the high heats encountered turned it into a solid as hard as stone and only by the application of heat could it be set. Company recently developed Sur-Mac, which combines with Sam-Bal, resulting in permanent set in which heat is not needed. When the two materials are used together a hard, firm, elastic film, with a high gloss finish, is formed that can be used for coating paper, embossing on leather, waterproofing electrical wire, and many other applications.

### High Dielectric Fatigue Material

Many electrical applications for molded plastics, especially the newer high tension automobile ignition parts, require a much higher dielectric breakdown and dielectric fatigue than was possible with ordinary molding materials. To meet these requirements, General Plastics has developed a material called 2491, available in black, brown, and red. Most of the rotors and coil caps for the 1936 motor cars are being made of this special molding material. According to A. S. T. M. tests recently completed, it has a dielectric breakdown of 550 V/M, and a dielectric fatigue of 400 V/M/M. When exposed to high tension current leakages, this special material resists the formation of carbon tracks or arcing channels, which results in the carbonization of ordinary molding material under the intense heat of the arc.

### Geranium Oil to Control Japanese Beetle

Traps baited with geranium oil provide the most satisfactory method of controlling the Japanese beetle, according to statement issued by the New York Botanical Garden.

### Palladium Plating Solution

The plating of palladium in a practical, commercial manner at reasonable cost is now possible through a new palladium plating solution developed by Pre-Metals, Inc., 120 Wall st., N. Y. C. Solution is recommended for flash coatings of cheap articles and also for the heavy plating if desired, to obtain a non-tarnishable plate comparable in durability with high-grade silver plate.

### Ammonium Sulfate in Weed Eradicator Solution

A non-inflammable weed eradicator, made by passage of an electric current through a saturated solution of ammonium sulfate creating persulfate, has been developed under the direction of Dr. R. B. Harvey at the University of Minnesota. After killing the weeds, the compound disintegrates, enriching the soil with nitrogen and sulfur.

### Electrotyper's Molding Material

"Tenaplate," a new molding material for electrotypers' use, is being marketed by Tenak Products, 8 South Dearborn st., Chicago, Ill. Material consists of a sheet of .006 inch aluminum, a layer of wax thereto, and a graphite coating. Total thickness is approximately 0.040 inches. This method is cheaper than the wax impression process and gives a much sharper, more accurate reproduction of halftones and types.

### Prevention Spew in Leather

A product for preventing spew in leather, also for removing spew that has formed in finished leather, is being marketed by the Bay State Chemical Co., Salem, Mass. "Driver" can be used on all leathers and generous samples are offered concerns encountering this trouble.

### Borax in Celery Growth

"Cracked stem" disease in celery growth, prevalent in Florida and other parts of the world, is being successfully prevented by the use of borax in small quantities. Investigations reported by the Florida Agricultural Experiment Station prove that it also increases the yield and quality of the product.

### Automotive Refinishing Primer

"Preparakote," a new primer for automotive refinishing is announced by the Finishes Division of du Pont. This not only forms an adhesive bond between the surface and the succeeding coat, but also serves as a filler. It can be drysanded in four hours after application, with a saving of from one to two days' time in refinishing some classes of automobiles.

### Synthetic Upholstery Fabric

A heavy duty rubber upholstering fabric for seat cushions and backs on trucks and buses where a tough, water-proof and sun-resisting material is required is being offered by the Fabrikoid Division of du Pont, under the name "Pontine." Fabric has an extremely tough surface and great tensile strength.

### New Sheeting

A new type of transparent waterproof sheeting, which is prepared from a base film of starch and coated with a cellulose solution, has recently been invented by Harold A. Levey, consulting chemical engineer with laboratories at 8127-33 Oleander st., New Orleans.

Development is covered in part by U. S. Patent No. 2,012,344 with several supplementary applications on file. New product consists of a composite or laminated sheet made up of a base film of treated starch, which is subsequently coated with a properly formulated solution of a cellulose ester, which renders it waterproof.

Most important aspect of this development, claims the inventor, is based upon the fact that this type of transparent waterproof sheeting can be marketed for about two-thirds of the cost of existing sheetings of somewhat similar nature. Sheeting is proof against grease, water, oil, dust and air. It is in process of being commercialized, and this new product is expected to be on the market in substantial amounts during the coming year.

### Aluminum Salts in White Leather

A chemical process to produce superior white leather with the use of aluminum salts was reported by August C. Orthmann, Orthmann Labs., Inc., Milwaukee, Wis., in an address to the local chapter of the American Interprofessional Institute. Process will enable shoe manufacturers to offer a higher type of white leather than at present.

### Hydrogen Peroxide as Seed Disinfectant

Dr. Winkelmann, in a note to the *Chemiker-Zeitung* on the proposal to use hydrogen peroxide solution as a seed disinfectant, states that although laboratory trials may have shown promising results, the only field experiments so far reported: namely, those of Pichler ("Phytopatholog. Ztsche.," 1935, 8, 245-251)—indicate that the peroxide is not likely to replace the seed disinfectants at present in use.

# Plant Operation and Control

## *A Digest of the Current Literature for Makers of Chemicals*

## Chemical Stoneware—

### Properties, and Uses In Plant Equipment Construction

**By Dr. Felix Singer**

In 1921, when I took up my work in the German stoneware industry, I examined the then existing stoneware bodies and recorded the physical properties which I found. These figures are given below, in comparison with those determined for material manufactured 12[1] years later, *i.e.*, in '33.

| | 1921 | 1933 |
|---|---|---|
| Compression strength: $kg/cm^2$ | 5816 | 8210 |
| Tensile strength: $kg/cm^2$ | 116 | 528 |
| Bending resistance: $kg/cm^2$ | 416 | 953 |
| Elastic modulus: $kg/mm^2$ | 4175 | 4175 |
| Torsional resistance: $kg/cm^2$ | 251 | 323 |
| Impact strength: $cmkg/cm^2$ | 1.9 | 4.97 |
| Abrasion test: loss in $cm^3$ | 3.0 | 0.6 |
| Water absorption: % | 0.5 | nil |
| Coefficient of expansion: $x\ 10^{-6}$ | 4.1 | 0.15 |
| Thermal conductivity: $kg.cal.m^{-1}.\ h^{-1}.\ {}^{\circ}C^{-1}$ | 1.35 | 3.95 |

If normal stoneware bodies, approximately characterized in this country by the German figures of 1921, have other materials added to them, the physical properties of the finished product, change with the composition.[2] All elements, oxides, carbides, nitrides, salts, etc., which, at 1,400° C., neither vaporize nor burn, neither decompose nor suffer any appreciable changes through reduction, can be added to normal stoneware bodies and influence the physical characteristics, chiefly within the limits shown in the above table. Further changes follow through alteration of the firing temperature, the preparation, etc.

This short account is quite sufficient to show that to Wood's definition of stoneware, correct in itself, should be added: "Modern chemical stoneware is a perfectly vitreous, white or colored, non-translucent, opaque, ceramic body, the chemical composition of which can vary within the widest limits, because in a suitably-prepared stoneware body can be introduced all materials which are all non-combustible, do not decompose or evaporate and cannot be reduced at about 1,400° C. These elements or compounds, alone or in the desired mixtures, can be added in small or large quantities and thus can physical characteristics be controlled and altered over a very wide range."

There is consequently not "one stoneware" only, but besides the ordinary stoneware for chemical purposes, as Wood so excellently describes it, a special stoneware should be demanded for each particular purpose. In this, there is the assumption that the user of the stoneware informs his supplier of the conditions for its use. Only then can the different stoneware bodies be made which are needed for many special new purposes in the chemical industry. A typical example is "Alchemite," the first British stoneware body with a water absorption of nil.[3] Another example is "white chemical stoneware."

In spite of this great variety of the different kinds of special stoneware, one characteristic is common to all ceramic bodies worthy of the name of "stoneware": They possess an unrivalled resistance to acids of all kinds (with the exception, already mentioned, of hydrofluoric acid) concentrated and diluted liquid acids, acid solutions of salts, acid gases, etc. This has been the immemorial characteristic quality of "stoneware." It was already being used about 2,000 years ago by the Romans for technical purposes (water conduits). Stoneware is, therefore, probably the oldest or one of the oldest engineering materials.

Stoneware[4] is a vitrified ceramic material not only perfectly insoluble in acids, but is so little attacked and altered by most of the other usual chemicals that it has been the most suitable material since the existence of the chemical industry to serve all purposes of application. The very first beginnings of chemical manufacture were founded on the use of stoneware as an engineering material. So, parallel with the brilliant history of the chemical industry, runs the steady development of stoneware for chemical purposes.

The production and development of sulfuric acid, hydrochloric and nitric acid was based on the use of this material. These industries employ stoneware in the form of cooling and washing towers, absorption and reaction towers, together with the appropriate fillings, well-contrived distributors of liquids and numerous other appliances. Condenser jars, receivers used in countless various cases, and coils, must satisfy the special condition of a rapid heat transfer without prejudice to their chemical and mechanical resistance. For the movement and mixing of chemically-active gases and fluids numerous apparatus and mechanical contrivances are necessary, such as injectors, elevators, emulsors, acid eggs, in which this is effected by steam or compressed air, or exhausters, centrifugal and force pumps which can also work as vacuum pumps or compressors. For their constructional perfection a specially accurate knowledge of the mechanical properties of the material is assumed. Hollow vessels in the form of pans, vats, tubs, tanks, jars, bottles, stirring dishes and vessels for the transport and working up of chemicals of all kinds are adapted in the most varied forms to the purpose for which they are destined, and manufactured in one piece with a capacity up to several hundred gallons. Regulating devices, such as cocks, valves, throttles and flanges and other junctions, require the greatest accuracy of design which, thanks to the good "workability" of stoneware, can be attained by grinding.

#### Hardness and Toughness

Whilst the density of stoneware in instances hitherto has played a decisive part, in other cases the great hardness and toughness come also into operation, for example, in mortars, flat and hollow, pebble mills, etc. Hardness, strength, density and chemical resistance make stoneware a valuable engineering material for the construction of rollers of all kinds as successfully used for different technical purposes, for example, in the textile industry; for bleaching plants; as coating rolls in the manufacture of photographic papers; as triturating rolls in the preparation of oil colors; further, as crushing and homogenizing rolls, particularly in the provision industry (milling and chocolate making).

According to the latest scientific research which has given an insight into the chemical and physical constitution of stoneware, it consists, in the fired state for the greater part, of glassy constituents in addition to crystallites which are partly introduced through the raw material and are partly formed anew. The physical and chemical characteristics depend to a far-reaching degree on the extent of the formation of the glassy components and crystallites, and on their relative relation one to the other. Their investigation and the knowledge of the causes of their formation today bear witness very largely to the development of the chemical stoneware industry. Digested from an article in a recent issue of British *Chemical Age*.

[1] Felix Singer: "Die Bedeutung des saeurefesten Steinzeugs fuer die Kunstseiden-Industrie" (The Importance of acid-proof Stoneware for the Artificial Silk Industry). "Deutsche Kunstseiden-Zeitung," No. 417, April 11, 1933.

[2] Felix Singer: "Das Steinzeug" (Stoneware), published by Friedr. Vieweg and Sohn A.-G., Braunschweig, 1929, page 36.

[3] Made by Doulton and Co., Ltd. See Felix Singer: "Alchemite, a New Ceramic Ware with a Water Absorption of Nil," *The Chemical Age*, June 30, 1934.

[4] Felix Singer: "Steinzeug als Werkstoff (Stoneware as an Engineering Material"), published by "Die Chemische Fabrik," Verlag Chemie G.m.b.H., Berlin.

## Benzol Production Methods

K. Butler discusses benzol production in company paper, "Accelerator," published by the Broken Hill Proprietary Co., New South Wales, and reprinted in full in *The Oil & Gas Journal*, Sept. 26, p51.

Benzol is a constituent of aromatic hydrocarbons known as "light oils" or "crude benzol," present in gas from the carbonization of bituminous coal from by-product coke ovens. Besides combustible gas, tar and ammonia are also by-products. Tar is removed by condensation; ammonia is recovered in the form of sulfate, by passing the ammonia-laden gas through a bath of sulfuric. Removal of "light oils" and subsequent treatment to benzol may be divided into 3 stages. 1. Absorption or "scrubbing" of the "light oil" or crude benzol from the gas by a paraffin oil, known as "wash oil" (distillation range 300° C. to 370° C.). 2. Separation of the "light oil" or crude benzol from the "wash oil" by volatilization with steam. 3. Purification of crude benzol and its "fractional distillation" into 3 refined products, i.e., benzol, toluol and solvent naphtha.

After removal of ammonia, gas is cooled by intensive spraying with water in towers known as final coolers. This cooling is necessary to insure efficient absorption of the "light oil" by the "wash oil," which takes place in the next stage of the process. The "light oil" charged gas passes in series through 4 steel towers, 90 ft. high and 12 ft. in diameter, filled with wooden grids. The "wash oil" is pumped to the top of each tower in series, and flows down over the grids, making intimate contact with the gas which passes in at the bottom and out at the top of each tower.

The "wash oil" removes 90 to 95% of the "light oil," or crude benzol vapor, from the gas, and leaves the "scrubbers" almost saturated with approximately 3% "light oil." From a ton of coal, 3.5 gals. of "light oil" are recovered.

Scrubbed gas passes on to a gas holder, where 40% of it is piped back to the coke ovens for use as fuel gas in the oven flues.

Following its saturation with "light oil," the "wash oil" is henceforth known as "benzolized oil," and is pumped to storage tanks.

### Benzolized Oil Treatment

In the second stage the "benzolized oil" is picked up by a pump and is passed to the vapor-to-oil heat exchangers, where the temperature of the oil is raised to approximately 94° C. This increase in temperature is brought about by the vapors from the "light oil" still, which give up some of their "sensible" or "latent" heat to the circulating "benzolized oil."

After flowing through the "exchanger," the preheated "benzolized oil" passes on to the "light oil" still, composed of 14 sections, 8 ft. 6 in. in diameter. Each section, except the bottom one, is provided with a large "bubble hood" and an overflow for the partially "debenzolized" wash oil to the section below. Benzolized oil enters the "light oil" still at the 2nd top section, and flows to the still at the rate of 24,000 gals. per hour.

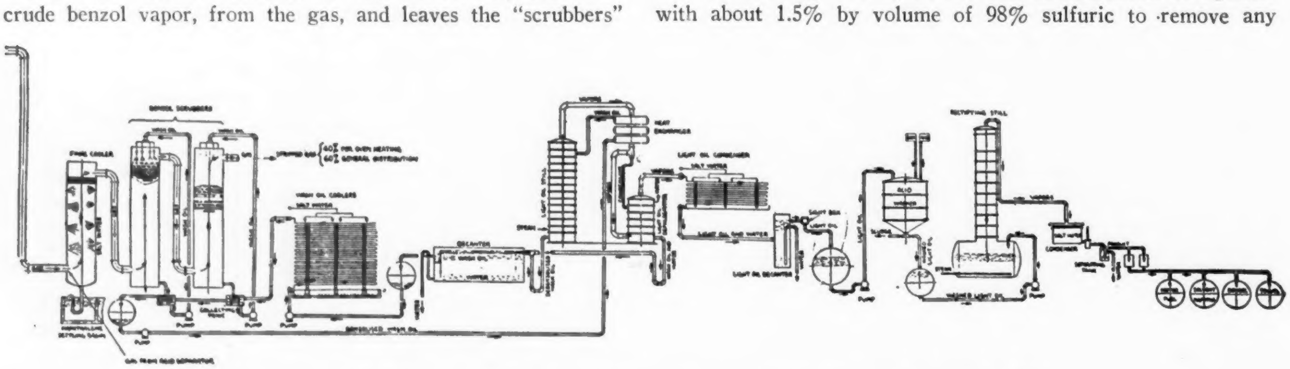
Steam is admitted into this still at the bottom, and, passing upwards, separates the "light oil" from the "benzolized oil." Separated "light oil," now in vapor condition, together with the steam, passes on to the "heat exchanger" already noted. Liberated "wash oil," now practically free of "light oil," passes downward through the bubble trays of the still, and, having been stripped of its crude benzol contents, is now known as "debenzolized oil." As this oil leaves the still it contains water —from condensed steam—together with minute quantities of carbonaceous matter entrained during the gas scrubbing process.

The oil thus regularly performs a complete cycle, scrubbing light oil from the gas; then, after being preheated, it is subjected to steam distillation in a modern unit to remove its light oil contents, then cleansed, cooled, and returned to the gas scrubbers. Light oil vapors leaving the still pass through heat exchangers in parallel, and join in a common header, entering the bottom of the light oil dephlegmator. Any condensate formed by steam and light oil vapors is cooled by the incoming "benzolized wash oil," and enters the dephlegmator at the second top section.

Cooling water is admitted directly into the top section of the dephlegmator to chill the vapors to the desired temperature. Flow of water is regulated by an automatic control valve. Cooling water, together with condensed steam and wash oil, leave the dephlegmator via a float valve, and pass on to the wash oil decanter.

Light vapors from the dephlegmator are now condensed in salt water condensers, and pass on to a light oil decanter, where separation of the crude benzol water takes place. Former passes to light oil storage tanks, while the water from this unit and from the wash oil decanter is pumped to an overhead storage tank, to be used for coke quenching.

In the 3rd stage the light oil is washed in a mixer or agitator with about 1.5% by volume of 98% sulfuric to remove any



*Flowsheet of the production of benzol in the modern plant described by K. Butler*

unsaturated hydrocarbons. Acid is continuously picked up at the bottom and sprayed over the surface of the light oil.

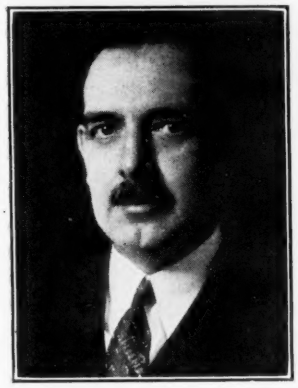
When laboratory tests show that the acid washing is complete, the acid sludge is allowed to settle, and is then "run off." Acid wash is followed by 2 water washes, and finally a neutralizing wash with soda solution. Washed light oil is then stored until required for final distillation in rectification stills.

These stills are heated by a nest of closed steam coils. Live steam may also be admitted at the bottom to assist in removal of higher boiling fractions. Above the still is a fractionating column and reflux condenser. Unlike the distillation of the "benzolized oil," which was carried out in a continuous type still, the rectification of the "washed light oil," or crude benzol is made by "batch distillation."

# Outstanding A. I. Ch. E. Reports

## Digest of the Leading Papers delivered at Columbus

Chemical superintendents, chemical engineers, and chemical consultants attending the 28th A. I. Ch. E. meeting at the Deshler-Wallack at Columbus, Nov. 13-15, heard a number of papers read of more than passing interest to plant men. Contrary to the impression prevailing in certain technical circles, metals in general and certain metals in particular, used in petroleum refining equipment, do not have a beneficial or detrimental effect in so far as the "cracking" of petroleum products to yield gasoline and other light derivatives is concerned. Theory that certain metals really aided the cracking process in a catalytic sense was dispelled by Dr. James R. Withrow, head of the Dept. of Chemical Engineering, Ohio State, and his associates in a laboratory research program, E. E. Slowter and F. B. Hotart, both of Battelle Memorial Institute.



*Consultant A. E. Marshall, A.I.Ch.E., presides at Columbus Meeting, 28th in the series.*

In Dr. Withrow's research program, gas oil, the petroleum product from which gasoline is derived in the cracking process, was brought in contact successively with 3 molten metals—tin, lead and steel. Various physical factors, such as temperature and depth of molten metal were varied. In so far as assisting or hindering the cracking process in a chemical sense was concerned, all 3 behaved the same. Physically, of course, some metals excelled through being better heat conductors and presenting cleaner surfaces than the metals usually employed in ordinary commercial practice.

### High Quality Lubricants by Chemical Methods

In spite of more rigid specifications for lubricants, resulting from the development of the automobile engine to its present state, high-quality lubricating oils may now be made from crude oils formerly considered too low grade for the purpose. Paradoxically, again, the cost to produce these high grade lubricants from crude oil promises to be less than formerly. All this was brought out thoroughly by Eugene R. Smoley and Wheaton W. Kraft of the Lummus Co.

High temperature automotive and industrial operation require high-test lubricants, it was pointed out, lubricants low in such impurities as tars, resins, waxes, etc., which lead to engine performance characterized by carbon forming, rapid oxidation, sludging, etc. These undesirable impurities are present in certain crude oils, but chemical engineering, the speaker showed, had found a way to eliminate them.

Chemical solvents, applied individually or collectively as a mixture is the key to the new technique. Where more than one solvent is used the composition is controlled to yield a lubricant of the desired characteristics. Sometimes 2 totally different solvents possessing diametrically opposite characteristics are employed. In any case the injurious substances are removed at the outset and never reach the engine to cause trouble.

While the value of these solvent processes for the production of high-quality lubricants is obvious, the speaker made a point of the fact that it was of more general importance that the decreased cost of such related processing steps as decolorization, clay treating, etc., may lead to substantial operating economies all along the line.

### Relationship between Flow and Heat Exchange Properties

Prof. William L. Badger, of the University of Michigan, authority on evaporation and author of several chemical engineering books on this field, made new disclosures on this subject. Viscosity or the readiness of a liquid to flow is the principal factor in determining the rate at which the heat in the liquid will pass through metal walls in contact with it, he said. Boiling point of the liquid itself and the temperature drop between it and its metal container are both factors of relatively less importance.

Prof. Badger's studies were made in the Chemical Engineering laboratories at Ann Arbor. He used sugar solutions of various viscosities in his work. From these he ascertained the viscosity of the film and then derived a simple mathematical equation for finding the overall coefficient of heat transfer. Conclusions and equations resulting from this work are expected to be of general significance to chemical engineering practice and of very great importance in the design and operation of forced circulation evaporators.

### Chemical Replacement of Boiler Water

According to a paper by Messrs. G. G. Brown, G. A. Gaffert, P. H. Konz and D. S. Ullock, all of the University of Michigan, Dowtherm A, a mixture of 2 coal tar derivatives, di-phenyl and di-phenyl oxide, freezes at 54.5° F., boils to yield a steam-like vapor and at the high temperatures used in modern power plant practice develops much less pressure than steam—a decided advantage.

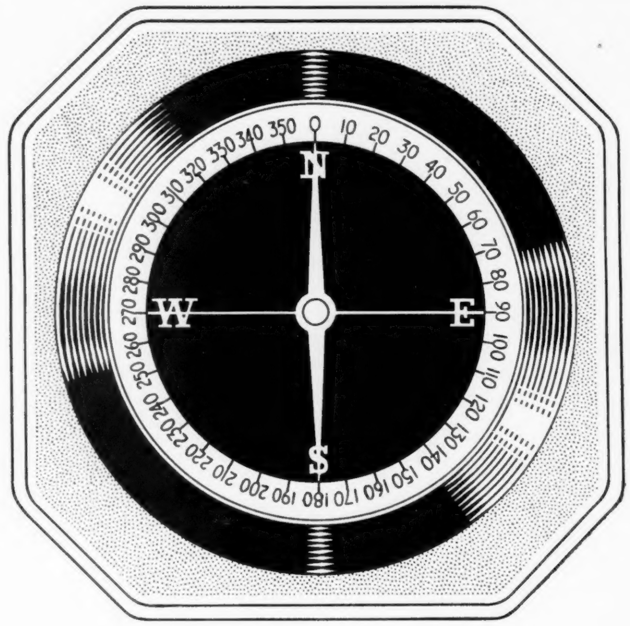
Data presented by the investigators supplies the information needed in the design of boilers and power units utilizing the new boiler fluid. Report states that the most important present use for the new substance is in an intermediate section of a special boiler between the actual fire and the steam boiler and that in this way a much greater power yield can be obtained from the fuel burned without producing excessive pressures. Savings are being effected in its use both in the initial investment in the power plant, the cost of whose boilers is a fraction of that of similarly efficient steam plants, and in the amount of fuel consumed per horse power hour of power output.

# The Laboratory

## Determining Small Traces of Lead

Analyzing fruit, foodstuffs, and liquids to determine how much lead they contain is not easy—especially if the material to be analyzed is unusually small and the lead in it weighs only a few thousandths of a milligram. Yet such measurements may reveal to scientists a clearer understanding of the composition of organic and inorganic materials, promote better industrial hygiene, and be of great aid to the food industry. Development of an improved colorimetric method for determining minute quantities of lead was reported Nov. 11, at the annual meeting of the Association of Official Agricultural Chemists at Washington. It was developed by chemists of the Food and Drug Administration, U. S. Dept. of Agriculture.

# ACCURATE

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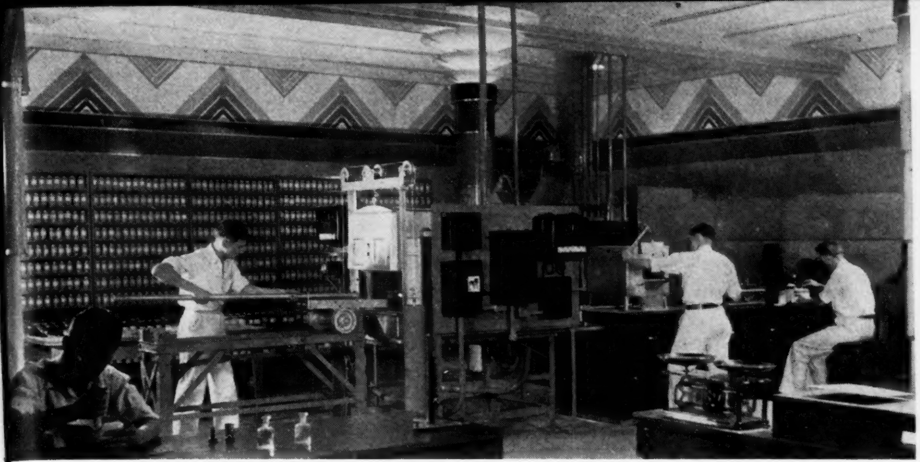
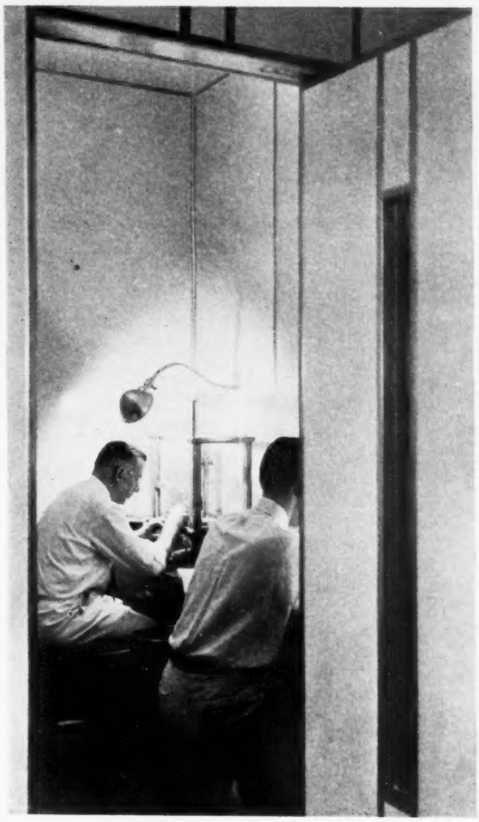




# The Laboratory Goes Modern

But a very few years past one of the principal topics of conversation among technical men was the poorly equipped quarters generally provided for research and control departments. Recently, a decided reaction has taken place, and major business executives appreciate clearly that high class work can only be done in satisfactory quarters and with necessary equipment.

Outstanding because they are splendid examples of this new trend, are the new laboratories of the Chicago Vitreous Enamel Product Co. of Chicago. They are unique because they have been designed to be the most efficient of their kind for the research, development and control of porcelain enamels, and for the reason that the method of construction used introduces a new and practical method for utilizing the unusual finishes and variety of color offered by porcelain enamel as a building material.

Nearly 13,000 square feet of porcelain enamel were used in finishing the interior walls, furniture, light fixtures, columns, etc., and, in two of the rooms, the ceilings. Two new types of finishes, developed primarily for architectural purposes were used. These are known as "satin matt" and "velvet matt." The effect obtained resembles very closely the names given these enamels.

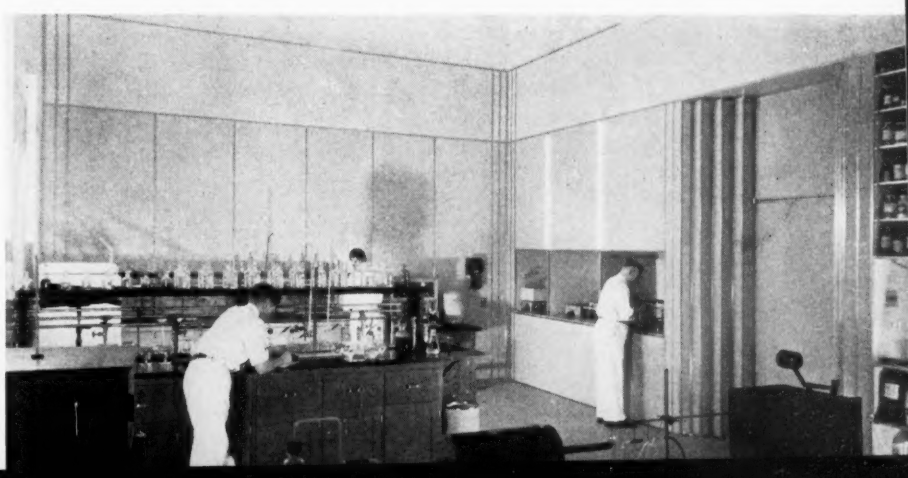
Main divisions of the laboratories are: main laboratory room, analytical chemical laboratory, office of the director of research, color and enamel control laboratory, physical instrument room, experimental smelting department, smelt record room and shower and locker room.

It is in the analytical chemical laboratory that all raw materials used in the manufacture of porcelain enamels by this company are checked. Following is a part of the equipment used in the chemical laboratory: electrolytic equipment for determining such elements in raw materials as nickel, cobalt and copper; draft-free balance room where all weighing is done with two chain-o-matic balances; a specially designed double work table which includes combustion equipment, a muffle furnace for igniting precipitates and thermostatic control baking equipment, and two of the most modern double chemical work benches obtainable, completely equipped for various types of analytical chemical work.

Main laboratory room contains 5,000 sq. ft. of floor space, and its walls are completely lined with porcelain enameled panels. The color scheme is reversed according to conventional ideas, inasmuch as the panels are light blue at the base and gradually become darker as they near the top, interspersed with continuous strips of satin-finished stainless steel around the room. At the top is an illuminated frieze, three and one-half feet high, starting 10 feet from the floor, which demonstrates the effectiveness of porcelain enamel under indirect lighting.

One of the outstanding features of the laboratories, and a contribution to the art works relating to porcelain enamel, is a striking oil painting showing a worker "tapping off" a smelt or porcelain enamel frit. It was done by Herbert H. Field, Jr., a prominent painter of industrial subjects.

Consultants employed in the construction: Leonard J. Krane, air conditioning; color, Louis H. Weinzelbaum; lighting, Kurt Versen.

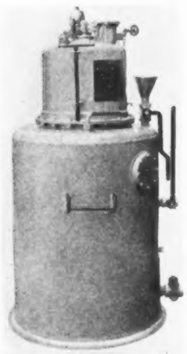


*All raw materials used are analyzed in this analytical chemical laboratory before being used. The walls and ceiling of this room are completely finished in acid-resisting "satin matt" porcelain enamel.*

*—Photos by Hedrich-Blessing Studio.*

# New Equipment

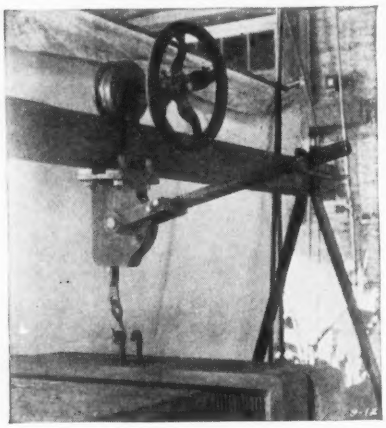
## New Acetylene Generator QC 308



A new small-size medium-pressure acetylene generator for portable or stationary service has just been announced and is known as the Oxweld Type MP-6 Medium Pressure Generator. This latest addition has a 50-lb. carbide capacity with a double rating of 100 cu. ft. of acetylene per hr. Developed for portable or stationary use with any type of oxy-acetylene cutting or welding apparatus, it meets the demand for small, rugged, low-priced generating equipment of modern design. A handwheel at the generator top makes it possible to control the carbide feed so that acetylene at any desired pressure up to 14 lb. per sq. in. may be obtained.

## Filter Plate Shifting Device QC 309

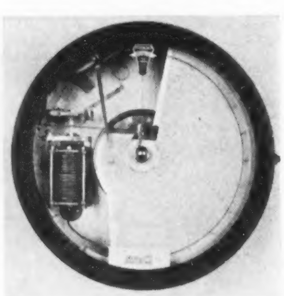
A recent development of important practical value in the operation of filter presses is a plate shifting device which makes it possible for one man to lift and shift even 500 lb. filter press plates, and do it easily and quickly. With this ingenious device one man can operate the largest filter press without assistance, presuming it is equipped with hydraulic or other mechanical closing.



As shown in the illustration this development consists simply of a lifting unit that travels the full length of the press on a steel rail directly above the center. Stout end supports rigidly hold the rail in this position, making it practically an integral part of the press. A steel eye is dropped from the lifting unit to engage hooks on the plates. Easy movement of a lever on the unit lifts the plates vertically to clear the handles from the side bars. Turning the traction wheel on unit shifts plates horizontally to required position. Plates remain suspended until released by hand grip on operating lever.

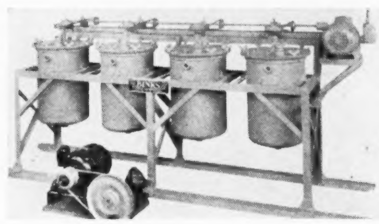
## Accurate Absolute Pressure Measurement QC 310

A new gauge to measure absolute pressure has a unique method of compensating for changes in barometric pressure that assures correct readings at all times. Pressure measuring and barometric compensation units are mounted together forming a complete, rugged and integral actuating movement. Two hydrons, one measuring direct pressure and the other barometric pressure, are so connected that their pressures directly oppose each other. The compensating hydron which is sealed under full vacuum exactly counterbalances the barometric effect on the main pressure hydron, and thus enables that hydron to measure only true absolute pressure.



## Series of Mixing Tanks QC 311

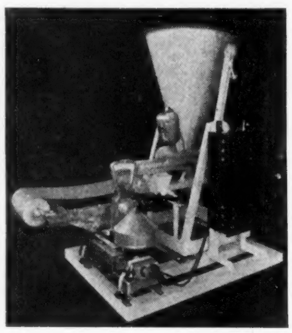
Problem of economically spraying bed springs and other large products in different colors has been effectively solved.



A series of mixing tanks, each with a different color, serves as the source of supply for paint or other finishing materials. Paint in these tanks is kept in a constant state of agitation by a motor driven shaft line connecting by a V-belt drive to the agitator shaft of each tank. While this equipment has been designed for the purpose just discussed the possibility of its adaptability to various chemical manufacturing operations should appeal to the ingenuity of chemical engineers, consultants, and plant superintendents.

## Continuous Weighing Made Easy QC 312

Continuous weighing machines are of distinct value in many fine chemical operations and in specialty production. These machines are built to order only, their size and price depending upon the maximum and minimum weight to be fed per minute and the character of the material to be handled. The complete machine as furnished is made up of: 1. A constant speed belt conveyor, 2. An accurate sensitive over and under type of scale, 3. A pulsating feeding conveyor, 4. A supply hopper equipped with a noiseless vibrator, 5. The electrical control panel. Accuracy is one of the main talking points of the manufacturer.



## New Distillation Apparatus QC 313

At the huge A. C. S. meeting held in N. Y. City last April chemical engineers acclaimed the paper of a Dr. Walter J. P. Podbielniak on a new distillation device as one of the most outstanding presented. A unit embodying the principals reported on then and known as the Centrifugal Counter-Current Super-Contractor for precise distillation is now available.

## Insulating Refractory QC 314

A Hydraulic Insulating Refractory Concrete "Insulcrete" that takes the place of fire brick and insulation combined for poured refractory furnace linings—doors—floors—covers—car tops—special shapes—backing-up, etc., has been developed.

## Analysis by Colorimetric Methods QC 315

Analytical and research chemists can increase speed and accuracy with new Duboscq colorimeters. Several new innovations have been added.

## Chipping Goggles QC 316

An improved wide vision chipping goggle for impact hazard work is announced.

Chemical Industries,
25 Spruce St., N. Y. City.

I would like to receive more detailed information on the following equipment: (Kindly check those desired.)

| | |
|---|---|
| QC 308 | QC 312 |
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| " 311 | " 315 |
| | " 316 |

Name ..........................................

Title ..........................................

Address ..........................................

# The Literature

**Articles of interest to the chemical and process industries particularly noted in a monthly review of the U. S. and foreign periodicals.**

**Corrosion.** "Equipment Corrosion in Kansas Wells Is Retarded by Chemical Treatment," by L. G. E. Bignell. Systematic application of chemical treatment is solving these most severe of corrosion problems. An article applicable to any chemical industry where corrosion is a problem of ever present importance. *The Oil & Gas Journal*, October 3, p32.

**Electrical Porcelains.** "Talc for Use in Electrical Porcelains," by Frank J. Fallon. Discussion of unique characteristics making Steatite porcelains superior to ordinary porcelains. A method of lowering thermal expansion is included. *Ceramic Industry*, October, p201.

**Ferric Oxide.** "Ferric Oxide in Industry," by E. S. Rippon. A review of properties and uses. *The Industrial Chemist* (British), September, p334.

**Gums.** "Gum Karaya; Apparent Viscosity of its Aqueous Solutions," by W. E. Thrun and H. V. Fuller. A valuable review of the sparse literature on this gum which closely resembles gum tragacanth. *Ind. & Eng. Chem.*, October, p1215.

**Metals.** "Metal Coloring," by M. deKay Thompson. Methods for producing artistic color effects on metals by electrodeposition, anodic oxidation, and other less technical methods are described. *Metal Cleaning & Finishing*, September, p433.

**Plant Operation.** "Southern Alkali Corporation Completes First Year's Operation of New Plant," by W. E. Trauffer. Brief description of process used at the Corpus Christi plant. *Pit & Quarry*, September, p22.

**Plastics.** "Koroseal—A New Plastic. Some Properties and Uses," by S. L. Brous and W. L. Semon. *India Rubber World*, September 1st., p45.

**Resins.** "Synthetic Resins for the Paper Industry," by Samuel S. Gutkin. Recently developed synthetic resins and their applications to new type varnishes are discussed with emphasis on their importance to the paper manufacturer. *The Paper Industry*, September, p405.

**Salt.** "Salt—Pioneer Chemical Industry of the Kanawha Valley. Development of Well Drilling," by E. T. Crawford, Jr. Historical treatment adds to the value of this thorough digest of salt well drilling for salt production, from 1808 to the present. *Ind. & Eng. Chem.*, October, p1109.

**Shellac.** "The Physical Properties of Lac. A Study of Available Data." A discussion of Dr. Lal C. Verman's recent study for the London Shellac Research Bureau. *The Chemical Age* (British), August 31, p188.

**Solvents.** "Lacquer Solvents in Commercial Use," by Arthur K. Doolittle. An effort to assemble the large amount of data and theory on the technology of lacquer formation. *Ind. & Eng. Chem.*, October, p1169.

**Sugar.** "Sugar Industries of the United States," by William D. Horne. The story of the sugar industry in the U. S., including recent developments in various fields. *Ind. & Eng. Chemistry*, September, p989.

**Washing & Bleaching.** "Laundry Washing and Bleaching," a review of the booklet of the same name, published by Imperial Chemical Industries Ltd. *The Chemical Age*, August 31, p191.

**Water Purification.** "Anthrafilt Gives Longer Filter Runs Than Sand," by H. G. Turner and G. S. Scott. *Water Works and Sewerage*, September, p308.

**Yeast.** "Yeast from Waste Sulfite Liquor." Description of process employed by a Liverpool, N. S., yeast plant. An interesting development in the wood pulp industry. *Canadian Chemistry & Metallurgy*, September, p243.

# Booklets & Catalogs

### Chemicals

**A476. American Cyanamid.** *American Hortigraphs & Agronomic Review*, November-December, of value to insecticide and fertilizer users. Issue contains items of technical as well as news interest to such widely varied fields as cotton, tobacco, and onion growers.

**A477. Eastman Kodak.** November-December *Synthetic Organic Chemicals* describes a fractionating vacuum pump and some new pump oils.

**A478. Electro Bleaching Gas.** October *Pioneer* outlines additional chlorine disinfectant uses. Included is a short description of the "cotton highway," recent southern development.

**A479. Givaudan-Delawanna.** October *Givaudanian* contains editorial discussion of N. Y. City's proposed amendments to the Sanitary Code, proposals affecting drug, chemical specialty and cosmetic manufacturers.

**A480. D. W. Haering & Co.** October, *H-O-H Lighthouse*, features short discussion of carbon, properties and uses.

**A481. Harshaw Chemical.** Latest catalog lists industrial chemicals manufactured and jobbed by this middle western producer.

**A482. Imperial Oil & Gas Products Co.**, Pittsburgh. "Carbon Black, Servant of Industry," instructive booklet of carbon black uses from ink to rubber tires.

**A483. National Aniline & Chemical.** *Dyestuffs*, for October quarter, describes National's Nacconol KP and Nacconol KPR. Included are studies of spring shoe & leather colors, women's spring glove colors, and a discussion of dyes for paper, by Ivar Ekholm.

**A484. The Neville Co.**, "Neville Coal Tar Solvents," 1935. Data reports properties and important uses of these solvents. Those included are standard coke oven light oil distillates, special coal-tar naphthas, and plasticizing oils.

**A485. Philadelphia Quartz.** November *Silicate P's & Q's* extols mud as a chemical raw material.

**A486. Philips Petroleum.** "Combustion Properties of Industrial Propane." Bulletin No. 55.

**A487. Philips Petroleum.** "Industrial Propane Used for Many Different Purposes at Steel Foundry." Bulletin No. 56.

**A488. Rolls Chemical**, Buffalo, N. Y. October-December *Retorts* contains news items of interest to chemical consumers in northern N. Y.

**A489. Van Dyk & Co.** "New Developments in Cosmetic Raw Materials." Probably as complete a short discussion on this subject as has ever been written.

**Monthly Price Lists**

**A490. Fritzsche Bros.'** November list.
**A491. Heyden Chemical's** November list.
**A492. Mallinckrodt's** November list.
**A493. Merck's** November list.

### Equipment

**A494. Bakelite Corp.** October *Bakelite Information* tells the intimate story of Bakelite's 1st quarter of a century.

**A495. Bausch & Lomb Optical Co.**, Rochester, N. Y. "A Catalog of Colorimetric Apparatus," attractive and valuable booklet, presents this line of colorimeters, hemoglobinometers, scopometers, nephelometers, and illuminators. Laboratory and research directors, etc., will find data invaluable.

**A496. Bausch & Lomb Optical Co.** "Instruments for Spectrographic Analysis," a valuable handbook on theory and use of optical instruments. Booklet includes a fine bibliography of spectrographic analysis.

**A497. The Brown Instrument Co.** "Tune in for Lower Process Costs," more descriptive material on use of new Brown "Air-o-Line," for pressure, temperature, flow, and liquid level control.

**A498. Climax Molybdenum Co.** October, *The Moly Matrix*, contains "Heavy Alloy Iron Castings," a reprint from *Metals & Alloys*, June, '35, by C. C. Miller, a discussion of molybdenum use in heavy iron castings.

**A499. The J. H. Day Co.**, Cincinnati, Ohio. Describes the entirely new, revolutionary Day RO-BALL Stabilized gyrating screen, Bulletin No. 363. Fully illustrated, each type of equipment is well described.

**A500. Eureka Machine Co.**, Cleveland. Eureka "Double Action Drum Washers." A "dirty" job can be made clean.

**A501. International Nickel.** *Inco*, Vol. XIII, No. 2, describes nickel's use in varied industries. Features story of new all metal radio tube.

**A502. Johns-Manville**, N. Y. City. New catalog illustrates industrial friction materials, both flexible and rigid styles.

**A503. Johns-Manville.** "Fire Tamers," tells the story of standardized refractory cement development in J-M research laboratories.

**A504. Linde Air Products**, N. Y. City. "The Repair of Damaged Cast Iron Machinery," 8-page booklet describing another use of oxy-acetylene welding.

**A505. David Linzer & Sons, Inc.** "Compo-Fibre," Linzer's new line of brushes is illustrated in new 64-page catalog.

**A506. Mine Safety Appliances**, Pittsburgh. M.S.A. "Comfo" Respirators, suitable for protection against dry or water mist supported dusts. Lightweight and comfortable.

**A507. Mine Safety Appliance Co.** New M.S.A. Light Weight Half-Hour Oxygen Breathing Apparatus. Bulletin BC-1.

**A508. Quimby Pump Co.**, 360 Thomas st., Newark, N. J. Quimby "Rotex" pumps, developed especially for handling viscous liquids and semi-liquids. Specifications and illustrations are included in this descriptive pamphlet. Bulletin R-200.

**A509. Raymond Bros. Impact Pulverizer Co.** A new grinding principle which eliminates metal-to-metal contact and is said to reduce power costs is illustrated in the booklet presenting the Raymond Bowl Mill.

**A510. Republic Steel.** "The Greatest Pipe Show on Earth," attractively edited little booklet, presenting Republic's iron or steel tube pipes.

**A511. The Sight Light Corp.**, N. Y. City. "The Sight Light Indicator," so small it will fit into your vest pocket, will determine how much light is available in your office, laboratory, or plant. A truly remarkable, and very useful, development, attractively described in this 4-page pamphlet.

**A512. The F. J. Stokes Machine Co.**, Philadelphia. *Process News* presents new methods and apparatus for chemical and pharmaceutical producers.

**A513. F. J. Stokes Machine Co.** Stokes' complete line of process equipment is described in new, 48-page catalog, illustrated with installation views, tables, charts, and simple diagrams. A discussion of the company's consultant service is included.

**A514. Syntron Co.** One-page leaflet describes a new continuous weighing machine for feeding at desired weight and speed.

**A515. Worthington Pump & Machinery.** Worthington's term purchase plan, inaugurated to aid manufacturers taking advantage of FHA loans for plant modernization.

**A516. Worthington Pump & Machinery.** Worthington Compressors, single horizontal, single stage, steam and motor driven. Bulletin L-611-B5A.

### Packaging

**A517. J. L. Ferguson Co.** October *Packomatic*, more news of the automatic packaging industries, featuring equipment used by brewers.

**A518. General Plastics, Inc.**, North Tonawanda, N. Y. October *Durez Packaging News* advances the idea that modern packages should have some after-use. Jewelry cases later used as cigarette cases are just one illustration of this modern idea. From shaving mugs to bottle caps, this booklet is chock full of new ideas.

**A519. Stokes & Smith Co.**, Philadelphia. "Neverstop" carton sealer or filler and sealer, invaluable machinery for automatic packaging.

**Received Late for Classification.**

**A520. Monsanto.** November *Monsanto Current Events.* Articles on wool and carbon black production aid in making an informative issue.

**Chemical Industries,**
**25 Spruce Street,**
**New York City.**

**I would like to receive the following booklets; specify by number:** ..............................

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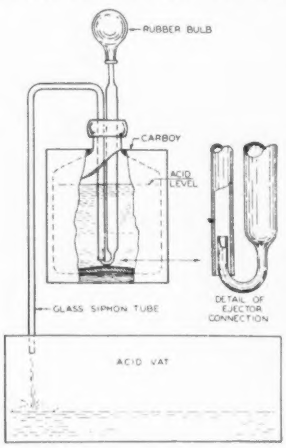
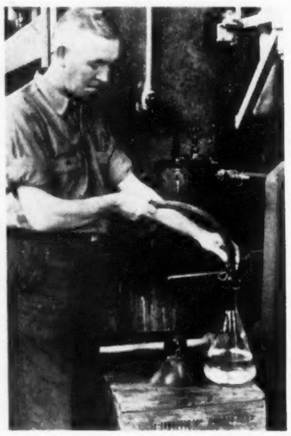
**Name** ..............................
**Title** ..............................
**Company** ..............................
**Address** ..............................

# Packaging, Handling and Shipping

**¶*Emptying Carboys Safely—Stacking Barrels Economically — Revolutionary Bag Closure — Other Notes—***

Acid carboys are always difficult to handle, and Westinghouse Lamp engineers, Bloomfield, N. J., have developed method of ejecting small quantities. A simple suction device is employed to draw quantities for use in processing lamp filaments. A filter flask is plugged with a rubber cork and 2 glass tubes. One tube drops down into the carboy; other is connected to a rubber suction hose. Air is withdrawn from the flask, creating



*Ejector device draws acid from carboy by suction and minimizes dangers of burns.*

a section which draws acid up from the carboy. Suction is created by a rubber hose attached to the section side of a laboratory water filter. As air is released from the pressure line through the nozzle of the water filter, it creates a suction in the hose, which, though slight, is sufficient to create enough vacuum in the filter flask to draw acid from the carboy.

A different siphoning arrangement is employed to empty a full carboy at one operation. Carboy bottle is plugged with a cork and 2 glass tubes, both of which extend to the bottom of the carboy and both of which fill with acid to the level inside. One tube is a siphon that runs out, over, and down into the vat below. Other tube parallels the 1st one and connects with it at the bottom of the bottle. Outside it is topped by a rubber bulb. Pressing the rubber bulb forces acid up into the siphon tube until it spills over and starts a flow down into the vat below.

### Handling the Barrel Stacking Problem Efficiently

A 75% saving in the cost of stacking barrels is claimed for a device for which C. C. Hassinger, superintendent at E. J. Lavino & Co.'s plant at Norristown, Pa., has applied for patents.

Photograph No. 1 shows how the device can be attached to the platform of the high lift electric trucks. No. 2 shows new method requires only one man and no more effort than the raising of the truck platform. No. 3 illustrates the saving in storage space made possible. At the Lavino plant barrels of ground manganese ore, weighing 1000 lbs. each are handled.

### Revolutionary Bag Closure by Bemis

A new device by Bemis Bro. Bag closes tops of open mouth multiwall bags, heavy duty paper, or waterproof bags. In the past these have usually been closed by wire ties. This type of closure was objectionable because a bag several inches larger than actually necessary was needed to allow for gathering the top of the bag together in order to put the tie around it. Furthermore, bags closed with wire ties are difficult to stack. Another type of closure has been simply to sew the top of the bag with a sewing machine. This closure was not satisfactory because of the sifting of the contents which the needle holes permitted.

Within the past few months Bemis has designed a very simple device for closing these bags. A Union Special sewing machine No. 80,600 is used. A 2½" paper tape is sewn across the top with filler cord inserted in the stitching at the same time. Device works rapidly, is inexpensive; makes a perfect closure and is attractive since top and bottom of the bag look alike. Attachment clips off the tape after the bag has been sewn. This eliminates necessity of having an extra man to sever tape between bags. Clipping device is operated by the same man who feeds the bags into the closing machine.

### Remote Registration of Weight

Remote registration of weight will be demonstrated by Toledo Scale at the Chemical Show. Having successfully transmitted weight a limited distance over electric wires, scale engineers foresee that it is only a step to increasing that distance. Possibility of using radio as the means of transmission is obvious. Applications of the new development are expected to be numerous in operations where actual work is remote from head offices, such as in many chemical operations, mining, etc.

### Cleaning and Refinishing Drums

Are you experiencing difficulties in the problem of cleaning and refinishing steel drums? "Steel Drums," an article written by Albert F. Byers of the Benjamin Franklin Paint & Varnish Co., and appearing in *Industrial Finishing* for October is worth reading.

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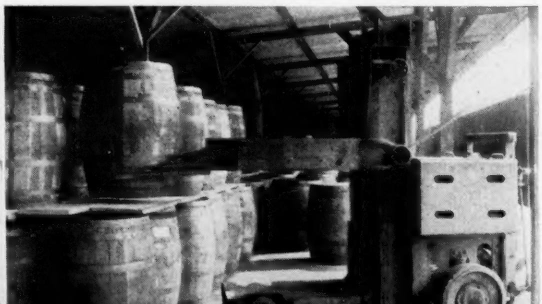

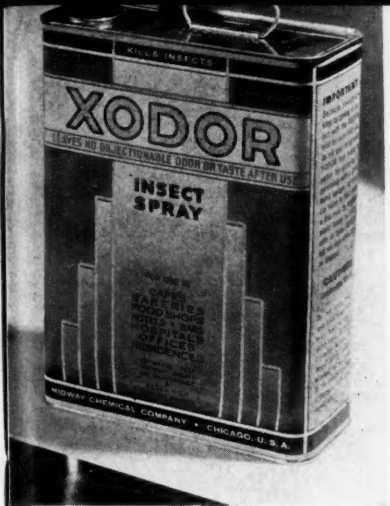


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# New Packages of the Month

1. Midway Chemical, important Chicago manufacturer of a wide line of chemical specialties, introduces a new and improved (odorless) insect spray, "Xodor." Design is simple, dignified, and different. Container by American Can.

2. One of the most outstanding packaging jobs "in many moons" is that done by the Flash Laboratories of Chicago for its new "Flash Fabric Cleaner." Colors used, red and white with black lettering.

3. "Lexol," the Martin Dennis Co.'s new leather conditioner and preservative, is packaged to look like leather. Its wrapper label is printed on leather-texture paper, which is varnished, to further the illusion. The small descriptive booklet which goes with the conditioner is likewise designed to look leather-like. Monroe F. Dreher, Inc., of Newark, N. J., designed them.

4. Rit Products, Chicago, designs an entirely new carton for its 10 ct. size package for sale principally in the chain stores. New layout is much simpler than the old and, therefor, easier to read.


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5. Blue Seal Chemical has built up an enviable reputation over a long period of years in the manufacture of a really workable drain-pipe solvent, marketed to a large extent directly through the plumbing supply jobbers. A new boiler liquid, a product which almost could be termed a companion product, has been developed after a long research period.

6. The "Family Idea" in packages is beautifully illustrated by the latest packaging change coming out of the Merck Packaging Laboratory at Rahway, N. J. They certainly depict dignity and supreme confidence in the products they contain.

7. Empire Distilling, back in the anti-freeze field, enters a gallon package of well-balanced design.


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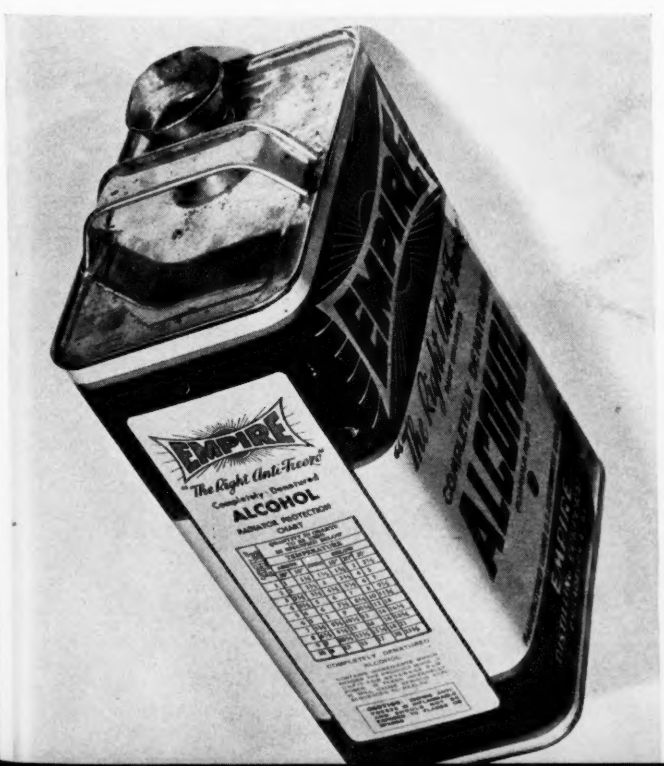


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# U. S. Chemical Patents

## *A Complete Check-List of Products, Apparatus, Equipment, Processes*

### Agricultural Chemicals

Production composition for insecticidal or fungicidal use. No. 2,018,681. John F. Littooy, San Francisco, and Frank Floyd Lindstaedt, Oakland, Cal., to Hercules Glue Co., a corp. of Cal.

Production nitrogen insecticide comprising a compound of hexamethylenetetramine with metal toxic. No. 2,019,121. Frank J. De Rewal, Camillus, N. Y., to Atmospheric Nitrogen Corp., N. Y. City.

Protecting vegetable matter from injurious animal life using liquid tri-amyl amine. No. 2,019,275. Philip Triest Sharples, Merion, Pa., to the Sharples Solvents Corp., Philadelphia, Pa.

Production sulfur in powdered form intermixed with pine oil and liquorice root. No. 2,019,443. Ludwig J. Christmann, Jersey City, and David W. Jayne, Jr., Elizabeth, N. J., to American Cyanamid Co., N. Y. City.

Production fertilizer composition containing ammonium nitrate and ammoniated triple superphosphate. No. 2,019,713. Charles Kiddell Lawrence, Syracuse, N. Y., to Atmospheric Nitrogen Corp., N. Y. City.

Production wax emulsions comprising paraffin, Carnauba wax, vegetable oil, oleic acid, and triethanolamine. No. 2,019,758. John R. MacRill, Whittier, Cal., to California Fruit Growers Exchange, Los Angeles, Cal.

Method detoxifying extract of pollen by adding formaldehyde to extract, then incubating. No. 2,019,808. Edgar B. Carter, Highland Park, Ill., to Abbott Laboratories, North Chicago, Ill.

Production peat-containing fertilizer. No. 2,019,824. Werner Liehr, Poggenhagen, near Neustadt am Rubenberge, to Eduard Dyckerhoff, Schloss Blumenau, near Wunstorf, Germany.

Method extracting pectin from cellulosic materials. No. 2,020,572. William C. Platt, Ontario, Cal., to California Fruit Growers Exchange, Los Angeles, Cal.

Use of organic peroxides in production of germicides, fungicides, etc. No. 2,020,648. Julius Hyman to Velsicol Corp., both of Chicago.

Process supplying fixed nitrogen to the soil by passing ammonia gas into irrigation water. No. 2,020,824. Cornelius B. de Bruyn to Shell Development Co., both of San Francisco, Cal.

### Cellulose

Production cellulose by treating pulp from alkaline digestion with chlorine at set pH. No. 2,017,985. Erich Opfermann, Berlin-Charlottenburg, and Gustav-Adolf Feldtmann, Dessau in Anhalt, Germany, to I. G., Frankfort-am-Main, Germany.

Coloration of organic substitution derivatives of cellulose by applying sulfonated organic compounds. No. 2,017,995. Edmund Stanley, Henry Charles Olpin, and George Holland Ellis, Spondon, near Derby, England, to Celanese Corp. of America, a corp. of Del.

Method of producing cellulose acetate by treating cellulose with acetylating agent in presence of catalyst and non-solvent dilutent. No. 2,018,028. George W. Miles, Boston, Mass., to Celanese Corp. of America, a corp. of Del.

Preservation of cellulosic materials, article composed of degummed cellulose fibers, toxic dye, filler of potassium bichromate, copper sulfate, acetic acid, and a tarlike armoring. No. 2,018,659. Wallace T. Conn, Lawrence, Mass., to the Government of the U. S., represented by the Sec. of Commerce.

Production preserved cellulosic material containing a tannic acid and tartar emetic mordant, and a potassium bichromate oxidant. No. 2,018,660. Wallace T. Conn, Lawrence, Mass., to the Government of the U. S., represented by the Sec. of Commerce.

Production protective agent for cellulose material comprising tar and oil soluble residue from reaction of alpha naphthylamine with acetaldol. No. 2,018,661. Wallace T. Conn, Lawrence, Mass., to the Government of the U. S., represented by the Sec. of Commerce.

Removal of water-soluble volatile solvent from nitrocellulosic mass by using successively air treatment, water treatment, then air treatment. No. 2,019,115. John H. Clewell, Arlington, and Floyd V. Wemple, North Arlington, N. J., to Du Pont Viscoloid Co., Wilmington, Del.

Apparatus for extruding web of cellulosic derivative plastic. No. 2,019,119. Paul W. Crane, Montclair, and Reuben T. Fields, Arlington, N. J., to Dupont Viscoloid Co., Wilmington, Del.

Production benzyl cellulose by reacting benzylating agent with water-soluble, high molecular weight, alkylated naphthalene sulfonic acid. No. 2,019,539. Alfred Stoyell Levesley, Saltcoats, and Frederick Charles Randall, Ardrossan, Scotland, to Imperial Chemical Industries Ltd., a corp. of Great Britain.

Production cellulosic products from lignified cellulosic materials. No. 2,019,598. Henry Dreyfus, London, England.

Production composition comprising a cellulose organic ester and para-phenyl acetophenone. No. 2,019,720. Thomas F. Murray, Jr., to Eastman Kodak Co., both of Rochester N. Y.

Production cellulose composition containing a carbamate. No. 2,019,892. Stewart J. Carroll and Henry B. Smith to Eastman Kodak Co., all of Rochester, N. Y.

Process for fibrous esterification of cellulose by pretreating with fatty acid. No. 2,019,920. Carl J. Malm and Charles L. Fletcher to Eastman Kodak Co., all of Rochester, N. Y.

Process stabilizing organic acid cellulose ester by treating with lower fatty acid and a liquid aliphatic hydrocarbon. No. 2,019,921. Carl J. Malm, Rochester, N. Y., and Charles L. Fletcher, Kingsport, Tenn., to Eastman Kodak Co., Rochester, N. Y.

Plasticizing agent for cellulose acetate composition by reacting phthalic anhydride with ethylene glycol, esterifying with alcohol, then heating with glycol. No. 2,020,247. Kenneth M. Irey, New Brunswick, N. J., to Commercial Solvents Corp., Terre Haute, Ind.

Production cellulose acetate of acetyl value above 56% dissolved in volatile ethylene formal as solvent. No. 2,020,338. George W. Seymour, Cumberland, Md., to Celanese Corp. of America, a corp. of Del.

Process separating benzyl cellulose from crude reaction mass. No. 2,020,934. Eduard Dorr, Wuppertal-Elberfeld, Germany, to Hercules Powder Co., Wilmington, Del.

*Patents digested include issues of the "Patent Gazette," Oct. 22 through Nov. 12 inclusive.*

### Chemical Specialties

Production of baking preparations from milk. No. 2,018,394. Alexander Axelrod, Zurich, Switzerland.

Production dry cleaning composition. No. 2,018,507. William H. Alton to R. T. Vanderbilt Co., Inc., both of N. Y. City.

Production photographic developer containing gelatin, borax, and acetone. No. 2,018,657. Charles W. Bennett, Douglaston, N. Y., to Photocast, Inc., Rochester, N. Y.

Production clean-up agent comprising mixture of comminuted copper and comminuted silver-colored clean-up material. No. 2,018,965. John D. McQuade, Lakewood, Ohio, to Kemet Laboratories Co., Inc., a corp. of N. Y.

Production light sensitive photographic material containing colloid carrier and light sensitive material of metal ortho-arsenite group. No. 2,019,737. Samuel E. Sheppard and Waldemar Vanselow to Eastman Kodak Co., all of Rochester, N. Y.

Use of glycerine and water solution in treating of dressed poultry. No. 2,019,756. Daniel E. Knowlton and Gilbert G. Early, Jr., to Buffalo Cold Storage Co., all of Buffalo, N. Y.

Production soap by mixing saponifiable and saponifying material to produce soap reaction. No. 2,019,775. Benjamin Clayton, Sugarland, Tex., and Ralph Everett Burns, Los Angeles, Cal., to Refining, Inc., Reno, Nev.

Apparatus for soap production. No. 2,019,776. Benjamin Clayton, Sugarland, Tex. and Ralph Everett Burns, Los Angeles, Cal., to Refining, Inc., Reno, Nev.

Production furniture and automobile polish. No. 2,020,125. John Rozig, N. Y. City.

Production thermoplastic composition comprising a triethanolamine soap and a water-insoluble metallic soap. No. 2,020,311. Laurence E. Harrison, Long Beach, Cal., to Oramold Products Corp., West Hollywood, Cal.

Production ultramarine blue gel. No. 2,020,539. Henry Dourif to The Standard Ultramarine Co., both of Huntington, W. Va.

Production photographic material. No. 2,020,607. Gerd Heymer, Dessau-Ziebigk Anhalt, Germany, to Agfa Ansco Corp., Binghamton, N. Y.

Sensitizing of silver halide emulsion containing an indocarbocyanine. No. 2,020,636. Walter Dieterle, Dessau in Anhalt, Germany, and Hermann Durr, Binghamton, N. Y., to Agfa Ansco Corp., Binghamton, N. Y.

Process for producing pictures. No. 2,020,901. Alfred Miller, Wolfen, Kries Bitterfeld, Germany, to Agfa Ansco Corp., Binghamton, N. Y.

Production emulsifier composition suitable for making aqueous emulsions. No. 2,021,027. Foster Dee Snell and Cyril S. Kimball, Brooklyn, N. Y.

### Coal Tar Chemicals

Production acetotricarballylic ester. No. 2,017,882. Frithjof Zwilgmeyer, Hamburg, N. Y., to National Aniline & Chemical Co., Inc., N. Y. City.

Production aroylamino anthraquinone acridone derivative. No. 2,017,936. Fritz Baumann, Leverkusen-I. G. Werk, Germany, to General Aniline Works, Inc., N. Y. City.

Production mineral acid solid diazonium salts. No. 2,018,095. Karl Schnitzpahn, Offenbach-am-Main, to General Aniline Works, Inc., N. Y. City.

Production condensation products from phloroglucine. No. 2,018,137. Leopold Laska and Oskar Haller, Offenbach-am-Main, Germany, to General Aniline Works, Inc., N. Y. City.

Production aldehydes by treating dicarboxylic acid substance with reducing gas in presence of catalyst. No. 2,018,350. Otto Drossbach and Adolf Johannsen, Ludwigshafen-am-Rhine, Germany, to General Aniline Works, Inc., N. Y. City.

Method carbonizing coal in externally heated intermittent carbonizing retort. No. 2,018,664. Wilhelm Fitz and Joseph Daniels, Essen/Ruhr, Germany.

Production diphenyl-methane derivatives by reacting halogen with 4′-alkyl-diphenylmethane-2-carboxylic acid. No. 2,018,775. Berthold Bienert, Leverkusen-I. G. Werk, and Robert Held, Leverkusen-Wiesdorf, Germany, to General Aniline Works, Inc., N. Y. City.

Production mu-arylene-thiazole and arylene oxazole sulfonic acid. No. 2,018,813. Max Schubert, Frankfort-am-Main-Fechenheim, and Ernst Herdieckerhoff, Opladen, near Cologne-am-Rhine, Germany, to General Aniline Works, Inc., N. Y. City.

Production poly-halogen-derivatives of pyrene. No. 2,018,935. Heinrich Vollmann, Frankfort-am-Main-Hochst, and Hans Becker, Hofheim-am-Taunus, Germany, to General Aniline Works, Inc., N. Y. City.

Production 1, 4-dihalogen-anthraquinone-2-carboxylic acids. No. 2,019,840. Berthold Bienert, Leverkusen-I. G. Werk, and Robert Held, Leverkusen-Wiesdorf, Germany, to General Aniline Works, Inc., N. Y. City.

Production indigo by subjecting alkali metal indoxyls to partial oxidation by means alkali metal hypohalites and completing oxidation with air.

No. 2,020,387. William Robert Waldron to E. I. du Pont de Nemours & Co., both of Wilmington, Del.

Production arylene-isothiazolones. No. 2,020,622. Norbert Steiger, Frankfort-am-Main, and Fritz Schulte, Frankfort-am-Main-Fechenheim, Germany, to General Aniline Works, Inc., N. Y. City.

Production condensation products of oxazine series. No. 2,020,651. Georg Kalischer, Cologne-am-Rhine-Marienburg, and Werner Zerweck, Frankfort-am-Main-Fechenheim, Germany, to General Aniline Works, Inc., N. Y. City.

## Coatings

Manufacture vermiculite bonded material. No. 2,017,904. James Keeth, Spokane, Wash., to Universal Insulation Co., Chicago, Ill.

Production building construction using composition board covered with layer asphaltum and coating of grits pressed into asphaltum. No. 2,018,216. Robert S. Maclean to Mastic Asphalt Corp., both of Michigan City, Ind.

Production composite electrical conductor comprising core member coated with finely divided silver coated metal particles mixed with organic binder. No. 2,018,343. Henri Bienfait and Willem Leendert Carolus van Zwet, Eindhoven, Netherlands, to Radio Corp. of America, a corp. of Del.

Production carpet material by coating backing with mixture of raw starch and rubber. No. 2,018,524. Albert W. Holmberg, Naugatuck, Conn., to U. S. Rubber Co., N. Y. City.

Production resinous coating composition comprising resin and solvent of petroleum distillate. No. 2,018,557. Horace H. Hopkins, Ridley Park, Pa., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Inhibiting metallic corrosion by coating metal surfaces with calcium sulfite. No. 2,018,682. James E. McConkie, Portland, Ore., to American Can Co., N. Y. City.

Veneer construction units using wood piles with a vegetable hemicellulose containing adhesive containing also caustic alkali and carbon bisulphide. No. 2,019,056. George H. Osgood and Russell G. Peterson, Tacoma, Wash.

Production laminated material using uniting film containing a polymer of a vinylethinyl carbinol. No. 2,019,118. Wallace H. Carothers, Arden, Gerald J. Berchet, Wilmington, and Ralph A. Jacobson, Arden, Del., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Production enamel coating on solid article. No. 2,019,676. Oscar Hommel, Pittsburgh, Pa., to Enamelers Guild, Inc., a corp. of Pa.

Process joining wooden surfaces using solution of water soluble urea-aldehyde condensation product and acid reacting agent inert to formaldehyde. No. 2,019,834. Karl Vierling, Matthias Schmihing, and Hugo Klingenberg, Ludwigshafen-am-Rhine, Germany, to I. G., Frankfort-am-Main, Germany.

Production lacquers from a definite urea formaldehyde compound. No. 2,019,865. Martin Luther, Mannheim, Wilhelm Pungs, Cologne, Robert Griessbach, Wolfen, and Claus Heuck, Leverkusen, Germany, to Unyte Corp., N. Y. City.

Production brush molding composition comprising carbon, with vinyl resin finely distributed over surface. No. 2,020,085. Carleton N. Smith, Lakewood, and Newcomb K. Chaney, Cleveland Heights, Ohio, to National Carbon Co., Inc., a corp. of N. Y.

Process of applying and removing protective coatings. No. 2,020,256. Lloyd G. Copeman to Copeman Laboratories Co., both of Flint, Mich.

Method increasing throwing power of chromium plating baths by using quinone in the bath. No. 2,020,382. Richard Schneidewind, Ann Arbor, Mich.

Production brake compositions using synthetic resin binder. No. 2,020,791. James Norman Longley to Ferodo Ltd., both of Chapel-en-le-Frith, England.

## Dyes, Stains, etc.

Production printing ink comprising phenol condensation product, China-wood oil, and wool grease. No. 2,018,060. August J. Gautsche, St. Louis, Mo.

Production hydrazine sulphonates as intermediates for production of azo dyestuffs. No. 2,018,103. Arthur Zitscher and Wilhelm Seidenfaden, Offenbach-am-Main, Germany, to General Aniline Works, Inc., N. Y. City.

Production azo dyes by coupling diazotized sulfanilic acid with resorcin, then with diazotized picramic acid, treating to amino compound, and finally diazotizing and coupling with resorcin. No. 2,018,234. Francis Hervey Smith, Woodstown, N. J., and Crayton Knox Black, Wilmington, Del., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Process producing prints or dyeings on animal fibers with acid mordant dyestuffs. No. 2,018,436. Philippe Brandt, Mulhouse, France, to firm Durand & Huguenin S. A., Basel, Switzerland.

Production azo dye. No. 2,018,764. Clifford Paine, Handforth, England, to Imperial Chemical Industries Ltd., a corp. of Great Britain.

Production azo dyestuffs. No. 2,018,801. Wilhelm Neelmeier, Leverkusen-I. G. Werk, and August Modersohn, Cologne-Mulheim, Germany, to General Aniline Works, Inc., N. Y. City.

Production enolic ethereal salts derived from indanthrone. No. 2,019,530. David Alexander Whyte Fairweather, Falkirk, and John Thomas, Polmont, Scotland, to Scottish Dyes Ltd., a corp. of Great Britain.

Production soluble ortho-hydroxyazo dyes. No. 2,019,830. Max Raeck, Dessau in Anhalt, Germany, to General Aniline Works, Inc., N. Y. City.

Production azodyestuffs. No. 2,019,844. Heinrich Clingestein, Cologne-am-Rhine, and Karl Dobmaier, Leverkusen-I. G. Werk, Germany, to General Aniline Works, Inc., N. Y. City.

Production dyestuff of the anthraquinone series. No. 2,019,846. Joseph Deinet, Milwaukee, Wis., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Production water-insoluble azo dyestuffs. No. 2,019,914. Herbert Kracker, Frankfort-am-Main-Hochst, Germany, to General Aniline Works, Inc., N. Y. City.

Production complex metal compounds of azo dyestuffs. No. 2,019,915. Hans Krzikalla and Karl Holzach, Ludwigshafen-am-Rhine, Germany, to General Aniline Works, Inc., N. Y. City.

Production sulfur dyes. No. 2,020,345. Max Wyler, Blackley, England, to Imperial Chemical Industries Ltd., a corp. of Great Britain.

Process dyeing fibrous material with alkaline soluble dye using reduced alkaline solution of dyestuff containing lecithin. No. 2,020,496. Paul Bolen, Atlanta, Ga., to American Lecithin Co., Cleveland, Ohio.

## Explosives

Production basic lead trinitroresorcinol by adding ammonium hydroxide to solution of trinitroresorcinol and then adding solution of lead nitrate. No. 2,020,665. Hans Tauson to Winchester Repeating Arms Co., both of New Haven, Conn.

## Fine Chemicals

Production 4-alkyl- and 4-aralkyl-dihydro-resorcinols. No. 2,018,213. Max Klingenfuss, Basel, Switzerland, to Hoffmann-La Roche Inc., Nutley, N. J.

Chlorination of aliphatic hydrocarbons by reacting HCl formed during chlorination with olefinic compounds at temperature converting olefines into saturated chloro-hydrocarbons. No. 2,018,345. Edgar C. Britton, Gerald H. Coleman, and Bartholdt C. Hadler to The Dow Chemical Co., all of Midland, Mich.

Purifying and decolorizing cinchophen by crystallizing ammonium alpha-phenylcinchonate from aqueous solution thereof. No. 2,018,354. Ernest F. Grether to The Dow Chemical Co., both of Midland, Mich.

Hydrogenation of pyridine bodies using catalyst of partially oxidized nickel. No. 2,018,680. Wilbur A. Lazier, Marshallton, Del., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Production hydroxypyrene. No. 2,018,792. Walter Kern, Sissach, near Basel, Switzerland, to firm Society of Chemical Industry in Basle, Basel, Switzerland.

Production complex metal compound of saturated aliphatic hydroxy carboxylic acids containing metal in higher state of valency. No. 2,018,811. Hans Schmidt, Vohwinkel, near Elberfeld, Germany, to Winthrop Chemical Co., Inc., N. Y. City.

Production intermediate hydrocarbon partial oxidation products by reacting with oxygen in presence small amount lower alkyl ether. No. 2,018,994. Stephen P. Burke, Plainfield, and Charles F. Fryling, Metuchen, N. J., to Doherty Research Co., N. Y. City.

Halogenation of diphenyl by reacting halo-di-phenyl vapor and a gaseous halogen. No. 2,019,015. Campbell R. McCullough, Anniston, Ala., to Swann Research, Inc., a corp. of Ala.

Process increasing color stability of amines by treating with small amount maleic anhydride. No. 2,019,032. Robert Paul Weiss and John Morris Weiss to Weiss & Downs, Inc., all of N. Y. City.

Production nitrochlor polyphenyl compound by subjecting isomeric mixture of halogenated polyphenyls to nitrating mixture of nitric and sulfuric. No. 2,019,337. Frank M. Clark, Pittsfield, Mass., to General Electric Co., a corp. of N. Y.

Hydrogenation of pyridine bodies using catalyst prepared by heating nitrogen base multiple chromate and hydrogenating metal, then reducing in hydrogen. No. 2,019,419. Wilbur A. Lazier, Marshallton, Del., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Production aminobenzothiazole compounds. No. 2,019,529. Max Englemann to E. I. du Pont de Nemours & Co., both of Wilmington, Del.

Production denatured alcohol of less than 5 carbon atoms, containing sucrose octa-acetate. No. 2,019,744. Herbert G. Stone, Kingsport, Tenn., to Eastman Kodak Co., Rochester, N. Y.

Method effecting addition of alkali metal to aromatic hydrocarbon of naphthalene group. No. 2,019,832. Norman D. Scott, Niagara Falls, N. Y., to E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

Production chloro-benzoylamino-anthraquinone. No. 2,019,837. Alexander J. Wuertz, Carrollville, and William Dettwyler, Milwaukee, Wis., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Production selenium containing anthraquinone compounds. No. 2,019,850. Ivan Gubelmann, Wilmington, Del., and William L. Rintelman, Carrollville, Wis., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Production alkylenediguanidine salts by reacting alkylenediamine with guanidine sulfocyanate. No. 2,019,872. Erich Prochnow, Berlin-Steglitz, Germany, to Anticonam G.m.b.H., Berlin-Halensee, Germany.

Dehydrogenation of hydrogenated heterocyclic compounds. No. 2,019,883. Carl Wulff and Wilhelm Breuers, Ludwigshafen-am-Rhine, Germany, to I. G., Frankfort-am-Main, Germany.

Production cyclo-pentyl barbituric acids. No. 2,019,936. Horace A. Shonle to Eli Lilly & Co., both of Indianapolis, Ind.

Preparation of diketene by polymerizing ketene in acetone solution. No. 2,019,983. George H. Law, South Charleston, W. Va., to Carbide & Carbon Chemicals Corp., a corp. of N. Y.

Production cyclic esters by depolymerizing the corresponding linear poly-ester. No. 2,020,298. Wallace Hume Carothers, Fairville, Pa., and Julian Werner Hill, Wilmington, Del., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Production dicarboxylic acid esters by reacting polycarboxylic acids with their anhydrides and with an alcohol. No. 2,020,356. Charles W. Hawley, New Brunswick, N. J., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Production composition comprising dry mixture of wetting agent and alkali metal sulfonate of aniline, benzene, or N-substituted-anilines. No. 2,020,385. William Todd, Manchester, England, to Imperial Chemical Industries Ltd., a corp. of Great Britain.

Production mercaptans and thio-ethers by treating olefin materials with oxygen acid. No. 2,020,421. William M. Lee, Bala-Cynwyd, Pa.

Production monocarboxylic acids and their derivatives. No. 2,020,505. Alphons O. Jaeger, Mount Lebanon, Pa., to American Cyanamid & Chemical Corp., a corp. of Del.

Production monocarboxylic acid salts by reacting salt of dicarboxylic acid and hydroxide of alkaline earth. No. 2,020,506. Joseph E. Jewett, Mount Lebanon, Pa., to American Cyanamid & Chemical Co., a corp. of Del.

Production bacterial solutions using alkaline aqueous solution of caustic soda and sodium salt of lauryl alcohol sulfuric ester. No. 2,020,647. Roderick Francis Hunwicke, Barnet, England.

Production thiazole substituted by a primary alkylamino group. No. 2,020,650. Treat B. Johnson, Bethany, Conn., to Winthrop Chemical Co., Inc., N. Y. City.

Production purified neoarsphenamine. No. 2,020,655. George W. Raiziss and Abraham I. Kremens, Philadelphia, Pa., to Abbott Laboratories, North Chicago, Ill.

Production esters of unsaturaed aliphatic carboxylic acid by reacting ester of halogenated formic acid with olefinic hydrocarbon. No. 2,020,685. Emmette F. Izard, Elsmere, Del., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Production alkylene diamines by reacting alkylene dihalide with ammonia in presence metal compound forming complex salt with diamine. No. 2,020,690. Werner M. Lauter, Akron, Ohio, to Wingfoot Corp., Wilmington, Del.

Production bornyl oxalates by reacting anhydrous oxalic acid with essence of turpentine without presence of solvent or condensing agent. No. 2,020,769. Etienne Darrasse, Paris, and Lucien Dupont, Vincennes, France; one half to Leon Darrasse, Paris, France, and Egon Elod, Carlsruhe, Germany.

Production cyclical disubstituted tetrazoles. No. 2,020,937. Zoltan Foldi, Budapest, Hungary, to the firm Chinoin Gyogyszer-es Vegyeszeti Termekek Gyara R. T./Dr. Kereszty & Dr. Wolf, Ujpest, Hungary.

Production hydroabietyl alcohols. No. 2,021,100. Clyde O. Henke, South Milwaukee, and Milton A. Prahl, Milwaukee, Wis., to E. I. du Pont de Nemours & Co., Wilmington, Del.

## Glass and Ceramics

Production cementitious tile. No. 2,018,192. August H. Sexton to Superior Cement Corp., both of Portsmouth, Ohio.

Production composition of matter of manufacture of artificial stone. No. 2,018,355. Charles H. Hagopian, N. Y. City.

Process frosting glass bulbs in gradation using hydrogen fluoride of sodium solution. No. 2,018,422. Yukitoshi Sakakura, Shibuya Machi, Toyotama Gun, Tokyo Fu, Japan.

Production porcelain relatively resistant to passage of X-rays. No. 2,018,600. Leslie Brown to Lenox Inc., both of Trenton, N. J.

Production soft glass composition of high electrical resistance containing lead oxide, and combined boric oxide and fluorine. No. 2,018,816. William C. Taylor to Corning Glass Works, both of Corning, N. Y.

Production soft glass composition of high electrical resistance containing silica, lead oxide, potassium oxide, sodium oxide, lithium oxide, and aluminum oxide. No. 2,018,817. William C. Taylor to Corning Glass Works, both of Corning, N. Y.

Production fused cast refractory article by fusion of magnesia and alumina. No. 2,019,208. Henry N. Baumann, Jr., and Charles McMullen to The Carborundum Co., all of Niagara Falls, N. Y.

Production cast refractory article of alumina, an alkaline oxide, and silica. No. 2,019,209. Raymond C. Benner and Henry N. Baumann, Jr., to The Carborundum Co., all of Niagara Falls, N. Y.

Production siliceous refractories by mixing ganister particles with aqueous dispersion of a barium compound. No. 2,019,542. John M. McKinley, East Cleveland, Ohio, to North American Refractories Co., Cleveland; and Willard K. Carter, Columbus, Ohio, to National Aluminate Corp., Chicago.

Production ceramic refractory by mixing fire-clay with aggregates, sodium aluminate, and water. No. 2,019,618. John M. McKinley, East Cleveland, and Willard K. Carter, Columbus, Ohio, to National Aluminate Corp., Chicago, Ill.

Production weathering-resistant, ceramic pipe by tempering fire-clay with water containing sodium aluminate. No. 2,019,619. Willard K. Carter and George H. Duncombe, Jr., Columbus, Ohio, to National Aluminate Corp., Chicago, Ill.

Production asbestos cement, sheets, tiles, etc. No. 2,019,852. Eric Russell Harrap, Chorlton-Cum-Hardy, Manchester, England, to Turner & Newall Ltd., Spotland, England.

Production glazing composition comprising cement material, water-insoluble soap, and ammonium tannate. No. 2,019,980. Victor P. Krauss, Flushing, N. Y., to American Kerament Corp., N. Y. City.

Production composition producing cold glaze on building materials. No. 2,019,981. Victor P. Krauss, Flushing, N. Y., to American Kerament Corp., N. Y. City.

Process of coloring bricks by mixing manganese, metallic red, and powdered zinc with fire clay dust and fine grade sand. No. 2,020,137. William S. Damhorst, Quincy, Ill.

Production of safety glass. No. 2,020,178. Jean Haas to Societe Generale d'Optique Societe Anonyme des Anciens Etablissements Huet & Cie et Jumelles Flammarion, both of Paris, France.

Method of cooling composition tile. No. 19,747—reissue. George P. Heppes, Upper Montclair, N. J., to The Tile-Tex Co., Chicago Heights, Ill.

Production mineral fiber by mixing clay and limestone. No. 2,020,403. Isaiah B. Engle, Tiffin, Ohio.

Process compounding glasses of usual soda-lime type by adding pre-fused barium borosilicate flux. No. 2,020,467. Erich Heinz, Hamburg, Germany.

Production dielectric material for condensers. No. 2,020,468. Raymond H. Hobrock, Chicago, Ill., to Western Electric Co., Inc., N. Y. City.

Method forming ceramic articles by copper plating a ferrous metal base, nickel plating, then applying enamel coating over nickel. No. 2,020,-477. Walter J. Scott, Brookfield, and Sumner R. Mason, Wilmette, Ill., to Western Electric Co., Inc., N. Y. City.

Production ceramic masses containing iron or iron oxide. No. 2,020,-713. Hans Wolff and Hermann Leuchs, Ludwigshafen-am-Rhine, Germany, to I. G., Frankfort-am-Main, Germany.

## Industrial Chemicals, Apparatus, etc.

Production light weight aggregate by rapidly cooling, reheating, and gradually recooling a molten slag. No. 2,017,889. Carrell W. Bowyer, Highland, Ind.

Purification impure zinc salt solutions containing alkaline earth or alkali metal compound by adding zinc fluosilicate and separating out precipitate. No. 2,017,930. Leon R. Westbrook, Cleveland Heights, Ohio, to The Grasselli Chemical Co., Cleveland, Ohio.

Production complex compound of alkali and alkaline earth metal halides. No. 2,017,976. Walter Kropp, Wuppertal-Elberfeld, Germany, to Winthrop Chemical Co., Inc., N. Y. City.

Process crystallizing a manganese nitrate hydrate by stirring melt with solid carbon dioxide. No. 2,017,980. Howard S. McQuaid, Lakewood, Ohio, to The Grasselli Chemical Co., Cleveland, Ohio.

Concentrating dilute aliphatic acid by extracting with solvent and subsequently removing water. No. 2,018,031. Horace Finningley Oxley and Walter Henry Groombridge, Spondon, near Derby, England, to Celanese Corp. of America, a corp. of Del.

Apparatus for separation by air of heavy granular particles from comminuted diatomaceous earth. No. 2,018,039. McKinley Stockton to The Dicalite Co., both of Los Angeles, Cal.

Method treating siliceous artiales. No. 2,018,056. Gaston Delpech, Clamart, France, to Societe Anonyme de Manufactures des Glaces & Produits Chimiques de Saint-Gobain, Chauny & Cirey, Paris, France.

Process extracting oil from cashew nuts. No. 2,018,091. Thomas M. Rector, Rutherford, N. J., to Baker-Bennett-Day, Inc., N. Y. City.

Method for transforming residual gas and blow-off gas into mixture of carbon monoxide, nitrogen, and hydrogen. No. 2,018,118. Raymond Blondelle to Societe des Mines de Dourges, both of Henin Lietard, France.

Production silicon carbide by electric furnace method, using batch containing sand, carbon, salt, and small amount buckwheat hulls No. 2,018,-133. Henry P. Kirchner to The Carborundum Co., both of Niagara Falls, N. Y.

Production high percentage alkali cyanides free from sulfides and chlorides. No. 2,018,135. Hermann Theodor Joseph Konig to N. V. Stikstofbindingsindustrie "Nederland," both of Dordrecht, Netherlands.

Balanced pressure method for introducing acid reagents into oil wells. No. 2,018,199. Richard H. Carr and Howard C. Humphrey to The Pure Oil Co., all of Chicago.

Process of carrying through gas reactions. No. 2,018,249. Nikodem Caro and Albert Rudolf Frank, Berlin, and Rudolf Wendlandt and Thomas Fischer, Piesteritz, near Wittenberg, Germany.

Production anhydrous hydrogen fluoride by fractional distillation. No. 2,018,397. William S. Calcott, Pennsgrove, N. J., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Production light abrasive composition comprising comminuted dicalcium phosphate dihydrate and a magnesium stabilizing agent. No. 2,018,410. Guy A. MacDonald and Dariel Miller, Chicago Heights, Ill., to Victor Chemical Works, a corp. of Illinois.

Production monocalcium phosphate by reacting strong phosphoric acid and a dry lime base under substantial vacuum. No. 2,018,449. William H. Knox, Jr., Nashville, Tenn., to Victor Chemical Works, a corp. of Illinois.

Process for recovery of beryllium sulfate from mixture of beryllium and aluminum sulfates. No. 2,018,473. Charles B. Sawyer and Bengt Kjellgren, Cleveland Heights, Ohio, to The Brush Beryllium Co., Cleveland, Ohio.

Production chemical asbestos. No. 2,018,478. Charles C. Whittier, Chicago.

Electric cell of Lalande type having zinc anode and electrolyte containing caustic, magnesium salt, and organic reducing agent. No. 2,018,-563. Martin L. Martus, Woodbury, and Edmund H. Becker, Waterbury, Conn.

Production sodium aluminate by reacting powdered alumina hydrate and solid caustic. No. 2,018,607. Russell E. Cushing, Haddonfield, N. J., and Clarence W. Burkhart, Lansdowne, Pa., to Pennsylvania Salt Mfg. Co., Philadelphia.

Production easily water soluble alkali metal metasilicate hydrate by solidifying mixture of alkali metal metasilicate with a peroxide, both in molten state. No. 2,018,632. Ernest R. Boller, Cleveland Heights, Ohio, to The Grasselli Chemical Co., Cleveland, Ohio.

Production flaked sodium chloride composition by flaking solidified paste of sodium chloride particles in organic adhesive. No. 2,018.633. Ernest R. Boller, Willoughby, Ohio, to The Grasselli Chemical Co., Cleveland, Ohio.

Production hydrogen by reacting mixture carbon monoxide and steam in presence carbonaceous material and magnesium oxide. No. 19,733—reissue. Fritz Hansgirg, Radenthein, Carinthia, Austria, to American Magnesium Metals Corp., Pittsburgh, Pa.

Production pyroxylin solution using organic sulfur compound as solvent. No. 2,018,767. William Seaman, Brooklyn, N. Y., to Standard Oil Development Co., a corp. of Del.

Method and apparatus for vacuum distillation of liquids. No. 2,018,-778. Karl Ebner, Frankfort-am-Main, Germany, to American Lurgi Corp., N. Y. City.

Production storable mixtures of lecithin and oil. No. 2,018,781. August Gehrke, Harburg-Wilhelmsburg, Germany.

Method for drying hygroscopic material. No. 2,018,797. Lawrence W. Lewis, Beverly Hills, Cal.

Liberation of alkali metals using mixture of stable alkali metal compound and cadmium. No. 2,018,815. Percy L. Spencer, West Newton, Mass., to Raytheon Mfg. Co., Newton, Mass.

Process of ammonia recovery from hot coal distillation gases by liquifaction and subsequent distillation. No. 2,018,863. Matthew J. Miller, Brooklyn, N. Y., to Semet-Solvay Engineering Corp., N. Y. City.

Process treating sugar solutions. No. 2,018,869. Holger de Fine Olivarius to California Packing Corp., both of San Francisco, Cal.

Method sterilizing liquids. No. 2,018,916. Georg Alexander Krause, Munich, Germany, to Katadyn, Inc., Dover, Del.

Process of activating bleaching clay material using aqueous solution of salt and free acid of salt. No. 2,018,987. Anton Wirzmuller to Bayerische Akteingesellschaft fur Chemische & Landwirtschaftlichchemische Fabrikate, both of Heufeld, Oberbayern, Germany.

Production electrical discharge material by making paste of barium and strontium carbonates with barium chloride, using distilled water. No. 2,018,993. Chester H. Braselton, N. Y. City, to Sirian Lamp Co., Newark, N. J.

Production heat-insulating, moisture-resistant mineral wool. No. 2,019,-021. Howard J. O'Brien, Alexandria, Ind., to Johns-Manville Corp., N. Y. City.

Production high molecular weight alcohols. No. 2,019,022. Norman D. Scott and Virgil L. Hansley, Niagara Falls, N. Y., to The E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

Use of sulfur dioxide and hypochlorite in bleaching organic colored fruits. No. 2,019,030. William K. Tucker, Berkeley, Cal., to California Packing Corp., San Francisco, Cal.

Process for dearsenication of sulfuric acid comprising treatment with hydrofluoric or hydrochloric acid or the halogen itself along with sulfuric. No. 2,019,038. Paul W. Bachman to General Chemical Co., both of N. Y. City.

Manufacture of fibroin solutions by dissolving in aqueous solution containing water-soluble metal thiocyanate. No. 2,019,225. Emil Hubert, Dessau in Anhalt, Wilhelm Irion, Bobingen, and Herbert Mahn, Dessau in Anhalt, Germany, to I. G., Frankfort-am-Main, Germany.

Production fibrous material container having fibers saturated with a non-adhesive acacia gum. No. 2,019,242. H. Crester Aument, Long Island City, N. Y.

Method cooling hot gases containing oxides of sulfur. No. 2,019,245. George A. Berry to Calco Chemical Co., both of Bound Brook, N. J.

Production magnesium chloride from dolomite. No. 2,019,265. Joseph S. Laird to Ford Motor Co., both of Dearborn, Mich.

Method concentrating different types of finely divided ores by flotation. No. 2,019,306. Royal S. Handy, Kellogg, Idaho.

Production snuffer composition comprising carbon containing compound. No. 2,019,339. Frank M. Clark, Pittsfield, Mass., to General Electric Co., a corp. of N. Y.

Preparation jelly-forming organic substances. No. 2,019,363. Rudolf Georg Schulz, Dusseldorf-Holthausen, Germany, to firm Henkel & Cie. G.m.b.H., Dusseldorf, Germany.

Production aluminum formate by recrystallization from aqueous solution. No. 2,019,415. Oskar Jochem, Greiz-Dolau, and Theodor Hennig, Greiz, Germany, to firm Zschimmer & Schwartz Chemische Fabrik Dolau, Greiz-Dolau, Germany.

Purifying gas which contains hydrogen sulfide. No. 2,019,468. Thomas S. Bacon to Lone Star Gas Co., both of Dallas, Tex.

Process removing soluble salts from magnesium hydroxide. No. 2,019,-488. William H. Farnsworth, San Mateo, Cal., to Marine Chemicals Co., Ltd., San Francisco, Cal.

Method activating alkaline earth oxide-coated cathode. No. 2,019,504. Charles H. Prescott, Jr., East Orange, N. J., to Bell Telephone Laboratories, Inc., N. Y. City.

Process for cooling gases. No. 2,019,533. Stanley L. Handforth, Woodbury, N. J., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Production oxide cathode comprising metal core, bronze coating of metal of tungsten or molybdenum group, and layer of alkaline earth metal oxide over coating. No. 2,019,546. Emil Theisz, Budapest, Hungary, to Egyesult Izzolampa es Villamossagi reszvenytarsasag, Ujpest, Hungary.

Production alumina by treating aluminous material with nitric acid in presence fluorine compound and decomposing the formed aluminum nitrate. No. 2,019,553. Charles B. Willmore, New Kensington, and Conral C. Callis, Oakmont, Pa., to Aluminum Co. of America, Pittsburgh, Pa.

Extraction alumina from aluminous material using nitric acid to obtain the nitrate, and then crystallizing out the salt. No. 2,019,554. Ralph B. Derr, Oakmont, Pa., to Aluminum Co. of America, Pittsburgh, Pa.

Method inhibiting attack of sulfur dioxide reaction compounds on metals using small amount aldehyde in sulfur dioxide gas stream. No. 2,019,559. Frank D. Burke, Rocky River, Ohio.

Method removing oxygen from gas mixtures by contacting with highly reactive carbon. No. 2,019,632. Arthur B. Ray, Bayside, N. Y., to Carbide & Carbon Chemicals Corp., a corp. of N. Y.

Production tetraphosphates by reacting alkali metal metaphosphate with an alkali metal base. No. 2,019,665. Augustus H. Fiske, Warren, and Charles S. Bryan, Providence, R. I., to Rumford Chemical Works, Rumford, R. I.

Production tetraphosphate by reacting alkali metal acid pyrophosphate with an alkali metal base. No. 2,019,666. Augustus H. Fiske, Warren, and Charles S. Bryan, Providence, R. I., to Rumford Chemical Works, Rumford, R. I.

Production organic acids using gaseous, adsorbent oxide catalyst to facilitate reaction. No. 2,019,754. John C. Woodhouse to E. I. du Pont de Nemours & Co., both of Wilmington, Del.

Continuous oxygen recorder. No. 2,019,871. Clark Pettingill, Seal Beach, and Elmer J. Barlow, Long Beach, Cal.

Production of sulfuric acid by contact process by producing the trioxide from acid sludge. No. 2,019,893. Cyril B. Clark, Scarsdale, N. Y., to American Cyanamid Co., N. Y. City.

Method packing acid sulfate and like compounds. No. 2,020,072. Leo Lowenstein, Berlin-Wilmersdorf, Germany.

Water feed system for lime hydrators. No. 2,020,098. Carlos M. Bird, Fajardo, Humacao, Puerto Rico.

Method bleaching mineral substances by preparing akaline metal hydrosulfite solution, also an acidified aqueous mixture of the mineral, mixing, and washing with said mixture. No. 2,020,132. Frederick W. Binns, Quincy, Mass., to Virginia Smelting Co., Portland, Maine.

Production solid carbon dioxide containing also another organic compound and water. No. 2,020,189. Charles L. Jones, Pelham, N. Y., to Adico Development Corp., N. Y. City.

Method cleaning milk containers and the like. No. 2,020,228. George B. Ashton, Riverside, Ill., to Victor Chemical Works, Chicago Heights, Ill.

Method increasing the viscosity of gelatin. No. 2,020,234. Jay Bowman, Chicago, Ill., and Vernon Leslie Harnack, Hammond, Ind., to United Chemical & Organic Products Co., a corp. of Del.

Propionic acid fermentation process. No. 2,020,251. Hugh R. Stiles to Commercial Solvents Corp., both of Terre Haute, Ind.

Method oxidizing electrode structure. No. 2,020,305. Sanford F. Essig, Philadelphia, Pa., to Radio Corp. of America, a corp. of Del.

Process treating polyhalite with dilute mineral acid. No. 2,020,322. Arthur Lambert to Rita Vinay, both of N. Y. City.

Production zinc sulfide by reacting sodium sulfide and zinc sulfate. No. 2,020,323. Thomas A. Mitchell and Royal L. Sessions to Hughes-Mitchell Processes Inc., all of Denver, Colo.

Method producing precipitates by reaction of a gas with a solution. No. 2,020,325. Arne J. Myhren and Byron Marquis, Palmerton, Pa., to The N. J. Zinc Co., N. Y. City.

Production primary aromatic amines by treating corresponding aromatic nitro compound with sheet ferrous metal, tin covered, in presence water and iron reduction catalyst. No. 2,020,368. Ford H. McBerty, Relay, Md., and Kenneth C. Simon, Woodbury, N. J., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Process making catalytic materials by immersing carrier in hot solution of soluble metal salts, crystallizing, drying carrier, and converting salts to oxides. No. 2,020,411. Paul S. Greer, Charleston, W. Va., to Carbide & Carbon Chemicals Corp., a corp. of N. Y.

Process reacting chlorine with metal-bearing solids. No. 2,020,431. Sidney G. Osborne, N. Y. City, and Jasper M. Rowland, deceased, late of Niagara Falls, N. Y., by Annie Gage Rowland, executrix, Niagara Falls, N. Y., to Hooker Electrochemical Co., Niagara Falls, N. Y.

Production phosphatide preparations by adding phosphatide to solid alkali metal hydroxide. No. 2,020,662. Albert Schwieger, Hamburg, Germany, to American Lecithin Co., Cleveland, Ohio.

Production oxygenated compounds of organic substances. No. 2,020,671. Henry Dreyfus, London, England.

Process for hydration of olefines by contacting with water vapor in presence of molten salt which acts as hydration agent. No. 2,020,672. Henry Dreyfus, London, England.

Production oxygen-containing addition products of ethylene. No. 2,020,673. Henry Dreyfus, London, England.

Production hydration products of olefines by reacting olefine with water in presence of metaphosphate of a metal. No. 2,020,674. Henry Dreyfus, London, England.

Cyclic manufacture of potassium carbonate from potassium chloride. No. 2,020,801. Friedrich Rusberg, Berlin-Niederschoneweide, Germany, to Kali-Chemie Aktiengesellschaft, Berlin, Germany.

Purification aqueous sodium hydroxide solutions containing mercaptides. No. 2,020,932. Robert E. Burk and Everett C. Hughes to The Standard Oil Co. (of Ohio), all of Cleveland, Ohio.

Production pure phosphoric acid by smelting phosphatic material, a carbonaceous material, and a flux. No. 2,020,976. Marvin J. Udy, Anniston, Ala., to Swann Research, Inc., a corp. of Ala.

Production composition of matter containing unsaturated, saponifiable, fatty acid material. No. 2,020,998. Melvin De Groote, St. Louis, and Bernhard Leiser, Webster Groves, Mo., to Tretolite Co., Webster Groves, Mo.

Production sulfo fatty body. No. 2,020,999. Melvin De Groote, St. Louis, and Bernhard Keiser, Webster Groves, Mo., to Tretolite Co., Webster Groves, Mo.

Production acid sodium pyrophosphate by heating mono sodium orthophosphate with water vapor. No. 2,021,012. Campbell R. McCullough, Anniston, Ala., to Swann Research, Inc., a corp. of Ala.

Method of briquetting coal. No. 2,021,020. Robert J. Piersol, Champaign, Ill.

Production solid carbon dioxide. No. 2,021,073. Guido Maiuri, Torino, Italy, to Maiuri Refrigeration Patents Ltd., Aldwych, London, England.

Production coarse, crystalline ammonium sulfate from synthetic ammonia. No. 2,021,093. Andreas von Kreisler, Frankfort-am-Main, Germany.

Production carbon black and other similar fine powders. No. 19,750—reissue. Edmund Billings, Weston, and Harold H. Offutt, Winchester, Mass., to Godfrey L. Cabot, Inc., Boston, Mass.

## Leather and Tanning

Method of patterning artificial leather etc. using light sensitive emulsion on surface. No. 2,017,853. Karl Eichstadt, Berlin, Germany, to Oxford Varnish Corp., Detroit, Mich.

Production synthetic tanning agent comprising a sulfonic acid type syntan mixed with a soluble carbohydrate. No. 2,017,863. Alphons O. Jaeger, Greentree, Pa., to American Cyanamid & Chemical Corp., N. Y. City.

Production depilatory agent for application to flesh side of hides, consisting of sodium sulfide base, thickening agent, and a soap. No. 2,018,359. Oonah Margaret Hedberg to Oonah Ltd., both of Christchurch, New Zealand.

Process filling leather by reacting vegetable tanning extract, aldehyde, and an ammonium salt between and on the fibers. No. 2,018,588. Lester M. Whitmore, Salem, Va., to Leas & McVitty, Inc., Philadelphia, Pa.

Process tanning skins by subjecting skin to action of tungsten compound in acid solution. No. 2,019,568. Herman A. Herzog, Newton, Mass., to A. C. Lawrence Leather Co., Boston, Mass.

## Metals, Alloys, Ores

Method forming electrode elements by heating copper plate to form oxide coating, and quenching in heavy mineral oil. No. 2,017,842. Harold B. Conant, Kansas City, Kans.

Fusing or welding rod comprising iron alloy containing carbon, manganese, silicon, phosphorus, and sulfur. No. 2,018,116. Walter S. Bingham, Cassopolis, Mich.

Production alloy of barium and aluminum. No. 2,018,143. John E. McCarty and Donald W. Randolph, Flint, Mich., to General Motors Corp., Detroit, Mich.

Rotary hearth furnace for production of lead from sulfide ores. No. 2,018,242. Felix Freiherr von Schlippenbach, Malaga, Spain, to American Lurgi Corp., N. Y. City.

Method condensing magnesium vapors by impinging against cooled surface coated with liquid film inert to magnesium. No. 2,018,265. Frank R. Kemmer, Larchmont, N. Y., to American Magnesium Metals Corp., Pittsburgh, Pa.

Production machine element comprising alloy steel containing chromium, copper, carbon, and iron. No. 2,018,267. Augustus B. Kinzel, Flushing, N. Y., and Walter Crafts, N. Y. City, to Electro Metallurgical Co., a corp. of W. Va.

Production industrial iron by means of iron sponge. No. 2,018,300. Heinrich Esser, Hilden, Germany.

Method providing uniform color surfaces for aluminum and aluminum-alloy articles by forming oxide coating and adsorbing inorganic solutions in coating. No. 2,018,388. Martin Tosterud, Arnold, Pa., to Aluminum Colors, Inc., Indianapolis, Ind.

Production rail vehicle axle journal brass comprising manganese and lead-bronze. No. 2,018,417. Walter Peyinghaus, Egge, near Volmarstein, Germany.

Production filament for electric lamp comprising refractory metal wire coated with mixture thorium oxide, and cerium oxide with boron oxide. No. 2,018,470. Samuel Ruben, N. Y. City, to Sirian Lamp Co., Newark, N. J.

Production high strength alloy containing nickel, cobalt, iron, titanium, and quenching to improve physical properties. No. 2,018,520. George P. Halliwell, Wilkinsburg, Pa., to Westinghouse Electric & Mfg. Co., a corp. of Pa.

Process treating aluminum surfaces by subjecting to action of alkaline water solution of borax and boric acid. No. 2,018,694. Herbert E. Wetherbee, Cleveland Heights, Ohio; one-tenth to Benton H. Grant and seven-tenths to Richard F. Grant, both of N. Y. City.

Production sintered alloy comprising mixtures of tungsten carbide and carbonitride, along with iron and chromium groups. No. 2,018,752. Richard R. Walter, Starnberg, Germany.

Production catalyst for ammonia oxidation comprising alloy of platinum, rhodium, and cobalt, annealed and acid washed. No. 2,018,760. George M. Hickey, Paoli, Pa., to J. Bishop & Co. Platinum Works, Malvern, Pa.

Galvanic battery consisting of homogeneous, malleable zinc-mercury alloy. No. 2,018,942. Henry Winder Brownsdon, Moseley, Birmingham, and Richard Chadwick, Heaton Grove,, Bradford, England, to Imperial Chemical Industries Ltd., a corp. of Great Britain.

Coloration aluminum articles by treating with solution of oxidizing agent then with alkaline solution, and finally with lake-forming dye. No. 2,019,229. James Francis Leahy to Atlas Tack Corp., both of Fairhaven, Mass.

Separation of metals by selective chloridization. No. 2,019,470. Jesse O. Betterton, Metuchen, N. J., to American Smelting & Refining Co., N. Y. City.

Process and apparatus for producing finely divided lead and lead compounds. No. 2,019,536. Paul Kemp, Perchtoldsdorf, and Emanuel Feuer, Liesing, Austria.

Production nickel-chromium alloy containing also small amounts calcium and zirconium. No. 2,019,686. James M. Lohr, Morristown, N. J., to Driver-Harris Co., Harrison, N. J.

Production nickel-chromium-iron alloy containing also small amounts calcium and zirconium. No. 2,019,687. James M. Lohr, Morristown, N. J., to Driver-Harris Co., Harrison, N. J.

Production nickel-chromium-iron alloy containing also small amount zirconium. No. 2,019,688. James M. Lohr, Morristown, N. J., to Driver-Harris Co., Harrison, N. J.

Production metal from ores by suspending ore in liquid fuel. No. 2,019,785. Hendrik Jan Jacob Janssen, The Hague, Netherlands, to Shell Development Co., San Francisco, Cal.

Production soldering alloy consisting of silver, copper, phosphorus, and zinc. No. 2,019,984. Robert H. Leach, Fairfield, Conn., to Handy & Harman, N. Y. City.

Process remelting iron to form castings by mixing silicon carbide with molten iron in presence slag. No. 2,020,171. William A. Brown, Connellsville, Pa., to The Carborundum Co., Niagara Falls, N. Y.

Method recovering lithium from its ores. No. 2,020,854. Walter Rosett, Oakcrest, Va., and Francis R. Bichowsky, Washington, D. C.

Production alloy containing silver, beryllium, and copper. No. 2,020,949. Robert H. Leach, Fairfield, Conn., to Handy & Harman, N. Y. City.

Production hard metal alloys containing tungsten, boron, cobalt or nickel, and either platinum, ruthenium, or osmium. No. 2,021,021. Alan Richard Powell and Ernest Robert Box to Johnson Matthey & Co., Ltd., all of London, England.

Method of attaching a piece of metallic carbide to a metallic body. No. 2,021,040. John A. Zublin, Bel Air, Cal.

## Naval Stores

Process for increasing melting point of rosin over pure abietic acid melting point. No. 2,017,866. Avery A. Morton, Watertown, Mass., to Columbia Naval Stores Co. of Del., Savannah, Ga.

Method refining rosin by mixing in a solvent. No. 2,018,634. Joseph N. Borglin to Hercules Powder Co., both of Wilmington, Del.

Method extracting rosin from resinous wood using organic aliphatic solvent from rosin. No. 19,749—reissue. Leavitt N. Bent, Holly Oak, Del., to Hercules Powder Co., Wilmington, Del.

## Paper and Pulp

Preparation thin, soft flexible porous paper sheet by quickly parchmentizing only the fiber surfaces. No. 2,018,244. Alexander V. Alm, Marblehead, Mass., to Dennison Mfg. Co., Framingham, Mass.

Production paper pulp from fibrous material such as flax. No. 2,018,490. Edwin P. Jones, Garden City, and James M. Dempsey, N. Y. City, to Champagne Paper Corp., N. Y. City.

Manufacture of transparent paper. No. 2,018,638. William Micheal Driesen, Clifton, N. J., to S. D. Warren Co., Boston, Mass.

Manufacture of sized papers by treating first with viscose solution, then with acidified glue solution. No. 2,018,875. George A. Richter to Brown Co., both of Berlin, N. H.

Production composite construction material formed from core of pulped ligno-cellulose material, and using casein cementing medium. No. 2,018,911. Philip B. Brill, New Haven, Conn., and George H. Ellis, St. Paul, Minn., to The Insulite Co., Minneapolis, Minn.

Production substantially white bleached fibrous material containing pentosans, lignin, and cellulose in certain proportions. No. 2,018,937. Sidney D. Wells and Gerald D. Muggleton to Lewis L. Alsted, all of Appleton, Wis.

Apparatus and method for treating and handling paper pulp and other fibrous materials No. 2,018,938. Sidney D. Wells to Lewis L. Alsted, both of Appleton, Wis.

Production synthetic lumber. No. 2,019,452. Charles E. Hartford, Dubuque, Iowa, to National Cornstalk Processes, Inc., Chicago, Ill.

Process and apparatus for making branded paper board. No. 2,019,845. Charles C. Colbert, George E. Preston, and Lloyd C. Daly, Elkhart, Ind.

Production manufacturing sized paper filled with alkaline filler. No. 2,020,328. Harold Robert Rafton, Andover, Mass., to Raffold Process Corp., a corp. of Mass.

Method bleaching vegetable fibers. No. 2,020,437. Irwin J. Smith, Albany, N. Y.

## Petroleum Chemicals

Production catalyst for polymerizing unsaturated hydrocarbons comprising mixture phosphoric acid and a solid adsorbent, calcined prior to use. No. 2,018,065. Vladimir Ipatieff to Universal Oil Products Co., both of Chicago.

Treatment hydrocarbon oils by polymerizing unsaturates using solid phosphoric acid catalyst in presence steam. No. 2,018,066. Vladimir Ipatieff to Universal Oil Products Co., both of Chicago.

Treatment of hydrocarbon oils by immersing pair of electrodes of catalytic metal and then dispersing metal in finely divided form by passage of current. No. 2,018,161. Harold C. Weber, Milton, Mass., to Universal Oil Products Co., Chicago.

Continuous mineral-contact process of breaking oil and water emulsions. No. 2,018,302. Harmon F. Fisher, Long Beach, Cal., to Petroleum Rectifying Co. of Cal., Los Angeles, Cal.

Method treating motor fuels using pellet of tetraethyl lead as core and container of stearic acid. No. 2,018,570. Paul Poetschke, Forest Hills, N. Y.

Apparatus for pyrogenic conversion of hydrocarbons having walls consisting of elementary silicon burned with a ceramic binding agent. No. 2,018,619. Fritz Winkler, Hans Haeuber, and Paul Feiler, Ludwigshafen-am-Rhine, Germany, to I. G., Frankfort-am-Main, Germany.

Treatment hydrocarbon oils with formaldehyde, a condensing agent, and acetic acid. No. 2,018,715. Stewart C. Fulton, Elizabeth, N. J., to Standard Oil Development Co., a corp. of Del.

Production lubricating composition comprising mineral lube oil, and product of reaction of an organic acid with alkylol group of alkylolamine. No. 2,018,758. Carleton Ellis, Montclair, N. J., to Standard Oil Development Co.

Method esterifying liquid polyhydroxy aliphatic alcohols by reacting with acetic ketene. No. 2,018,759. Per K. Frolich and Peter J. Wiezevich, Elizabeth, N. J., to Standard Oil Development Co., a corp. of Del.

Process obtaining by-products from hydrocarbon oils. No. 2,018,772. Philip L. Young, N. Y. City, to Standard Oil Development Co.

Production high quality lubricating oils. No. 2,018,871. Mathias Pier, Heidelberg, and August Eisenhut, Heidelberg-Wieblingen, Germany, to I. G., Frankfort-am-Main, Germany.

Production low boiling cracked hydrocarbon distillate containing fluorene type, compound as gum inhibitor. No. 2,018,979. Le Roy G. Story, Glenham, N. Y., to The Texas Co., N. Y. City.

Production improved lubricating oils by treating in presence aluminum chlorid. No. 2,019,037. Eugene Ayres and Herschel G. Smith, Swarthmore, Pa., to Gulf Refining Co., Pittsburgh, Pa.

Removal of sulfur compounds from gasoline by subjecting vaporized fuel to action of fuller's earth. No. 2,019,184. Thomas T. Gray, Elizabeth, N. J., to The Gray Processes Corp., Newark, N. J.

Production aliphatic tertiary alcohols from acid liquor obtained by adsorption of tertiary olefine in strong polybasic acid aqueous solution. No. 2,019,762. Richard Moravec and William Engs, Berkeley, Cal., to Shell Development Co., San Francisco, Cal.

Method treating mineral oil distillates. No. 2,019,772. Adrianus Johannes van Peski, Bussum, Netherlands, to Shell Development Co., San Francisco, Cal.

Method inhibiting gum formation in motor fuels by adding anti-oxidants comprising alpha-substituted aromatic condensed ring hydrocarbons. No. 2,019,899. Herbert G. M. Fischer, Westfield, and Clifford E. Gustafson, Elizabeth, N. J., to Gasoline Antioxidant Co.

Method of plugging strata in wells by injecting liquid halogen of silicon or titanium group. No. 2,019,908. Harvey T. Kennedy, Wilkinsburg, and Howard C. Lawton, Pittsburgh, Pa., to Gulf Research & Development Corp., Wilmington, Del.

Production extreme pressure lubricating composition comprising admixture of lubricating oil and a thiocarbonate. No. 2,020,021. Bruce B. Farrington and Robert L. Humphreys, Berkeley, Calif., to Standard Oil Co. of California, San Francisco, Calif.

Production low pour lubricating oil by dewaxing with acetone, toluol and benzol. No. 2,020,066. Merrill Kiser to Indian Refining Co., both of Lawrenceville, Ill.

Method refining hydrocarbon oils using aliphatic acyl derivatives of furan. No. 2,020,290. Louis A. Clarke, Fishkill, N. Y., to The Texas Co., N. Y. City.

Production brake fluid consisting of castor oil and ethyl acetate. No. 2,020,543. Franklin Phineas Frey, Cleveland, Okla., to Johnson Oil Refining Co., Chicago.

Conversion gaseous olefins to liquid hydrocarbons by polymerizing in presence solid mixture phosphoric acid and zinc oxide. No. 2,020,649. Vladimir Ipatieff to Universal Oil Products Co., both of Chicago.

Process removing elemental sulfur from petroleum oils. No. 2,020,661. Walter A. Schulze and Lovell V. Chaney to Philips Petroleum Co., all of Bartlesville, Okla.

Production lubricating oil containing a polymerization product of an unsaturated alcohol vinyl ether. No. 2,020,703. Curt Schumann, Eduard Muench, and Hanns Ufer, Ludwigshafen-am-Rhine, Germany, to I. G., Frankfort-am-Main, Germany.

Production lubricating hydrocarbon product. No. 2,020,714. Carl Wulff and Wilhelm Breuers, Ludwigshafen-am-Rhine, Germany, to I. G., Frankfort-am-Main, Germany.

Process refining lubricating oils using aluminum chloride and fuller's earth. No. 2,020,954. John M. Musselman to The Standard Oil Co., both of Cleveland, Ohio.

Method improving anti-knock quality of motor fuel by adding ethylene diamine. No. 2,021,088. Ernest F. Pevere, Beacon, N. Y., to The Texas Co., N. Y. City.

## Pigments

Manufacture of aluminum bronze powder. No. 2,017,850. Dale M. Boothman, Oakmont, Pa., to Aluminum Co. of America, Pittsburgh, Pa.

Production of aluminum bronze powder pigments. No. 2,017,851. Dale M. Boothman, Oakmont, Pa., to Aluminum Co. of America, Pittsburgh, Pa.

Pigment production by recovering lead from concentrated chloride brine containing lead salts by treating with calcium hydroxide. No. 2,018,438. Niels C. Christensen, Salt Lake City, Utah.

Production calcium sulfate in aqueous medium. No. 2,018,955. Winfield W. Heckert, Ardentown, and Gordon D. Patterson, Wilmington, Del., to Krebs Pigment & Color Corp., Newark, N. J.

Production of pigment from zinc sulfide bearing material. No. 2,020,313. Leon S. Holstein, Great Neck, N. Y., and George F. A. Stutz, Palmerton, Pa., to The N. J. Zinc Co., N. Y. City.

Production zinc sulfide pigment by wet precipitation through reaction of zinc sulfate with hydrogen sulfide gas. No. 2,020,902. Arne J. Myhren and Byron Marquis, Palmerton, Pa., to The N. J. Zinc Co., N. Y. City.

Production zinc sulfide pigment. No. 2,020,918. George F. A. Stutz and Arne J. Myhren, Palmerton, Pa., to The N. J. Zinc Co., N. Y. City.

Production mineral oil substitute paint vehicle. No. 2,020,936. Giovanni Piore, N. Y. City.

## Resins, Plastics, etc.

Production phenolic resinous reaction products of hydroxydiphenyl and formaldehyde. No. 2,017,877. Victor H. Turkington, Caldwell, and William Henry Butler, Arlington, N. J., to Bakelite Corp., N. Y. City.

Production plastic or coating resin by reacting phenol with sulfur dichloride. No. 2,017,993. George W. Seymour, Cumberland, Md., to Celanese Corp. of America, a corp. of Del.

Production plastic composition comprising intimate mixture of discrete particles of vulcanized rubber and surface-coated with flexible alkyd resin. No. 2,018,492. Herman L. Grupe, Scotia, and Roy H. Kienle, Schenectady, N. Y., to General Electric Co., a corp. of N. Y.

Production resins from tars consisting of cracked tar and petroleum pitch by treating with sulfuric acid and a metallic anhydrous chloride. No. 2,018,771. Clarence R. Wise, Roselle, and David F. Edwards, Elizabeth, N. J., to Standard Oil Development Co., a corp. of Del.

Production composition containing chlor olefin and chlor polyphenyl. No. 2,019,338. Frank M. Clark, Pittsfield, Mass., to General Electric Co., a corp. of N. Y.

Method obtaining aqueous colloidal suspension of alkyd resin by heating in aqueous medium in presence clay. No. 2,019,349. Richard Daniel Kleeman, Schenectady, N. Y., to General Electric Co., a corp. of N. Y.

Production urea-condensation resinous compositions. No. 2,019,354. Barnard M. Marks, Arlington, N. J., to Dupont Viscoloid Co., Wilmington, Del.

Production resinous materials by reaction of urea and formaldehyde. No. 2,019,453. Arthur M. Howald, Pittsburgh, Pa., to Toledo Synthetic Products, Inc., Toledo, Ohio.

Production cyanamide resin by adding formaldehyde to unaltered cyanamide solution, separating the precipitate, and combining precipitate with water. No. 2,019,490. Palmer W. Griffith, Elizabeth, N. J., to American Cyanamid Co., a corp. of Maine.

Production modified polyhydric alcohol-polybasic acid resins. No. 2,019,510. Ben E. Sorenson to E. I. du Pont de Nemours & Co., both of Wilmington, Del.

Production synthetic resin by incorporating a urea formaldehyde resin with a phthalic anhydride glycerine resin and mixing with phenol formaldehyde and filler resin. No. 2,019,591. Walter Wollaston, North Muskegon, Mich., to The Brunswick-Balke-Collender Co., Chicago.

Production molding composition of urea-formaldehyde impregnated cellulose filler. No. 2,020,024. Kenneth N. Francisco, Mountainside, N. J., to American Cyanamid Co., a corp. of Maine.

Production moldable composition comprising synthetic resins, rubber, and other moldable substances. No. 2,020,214. Arthur Geoffrey Rendall to Morland & Impey Ltd., both of Northfield, Birmingham, England.

Manufacture of sheets and threads from polyvinyl chloride. No. 2,020,642. Max Hagedorn, Dessau in Anhalt, Germany, to Agfa Ansco Corp., Binghamton, N. Y.

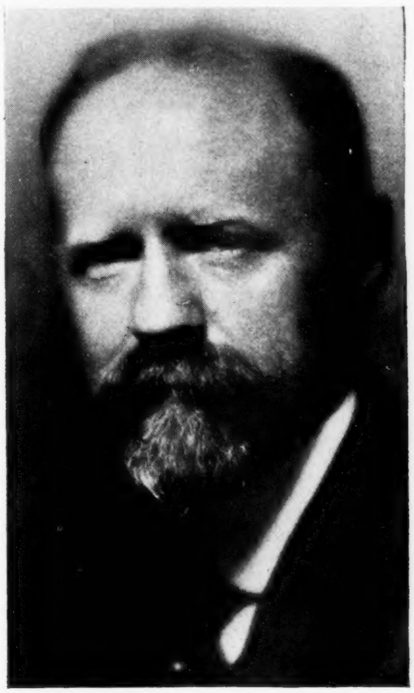
Production plastic impression material comprising emulsified mixture. No. 2,021,058. Laurence E. Harrison, Long Beach, Cal., to Oramold Products Corp., West Hollywood, Cal.

Production plastic compositions consisting of resin and cellulose derivatives. No. 2,021,121. Harry Ben Dykstra, Wilmington, Del., and Walter Eastby Lawson, Woodbury, N. J., to E. I. du Pont de Nemours & Co., Wilmington, Del.

# Chemical Markets & News

**Bell, Alliance Head, Reports Industry Against a Modified NRA—Old Question of Oil Reserves from a New Angle—Turner Dies of Heart Attack—Melvin, NFA President, Succumbs on Eve of Atlanta Meeting—Ittner Heads A.I.Ch.E.—Acetic Tariff Rate Reduced in New Trade Pact with Canada—Bichromates ⅜c Higher—Nichols Criticizes Allied Management—Shortage of Naphthalene—Industry Aroused Over Patented Denaturants—Du Pont Announces Crystal Urea—**

Does the chemical industry want a revived NRA in modified form? Cyanamid's William B. Bell, spokesman for the industry and president of the Chemical Alliance, says decidedly no; Major



WILLIAM B. BELL
*"Ninety-six per cent. of the Chemical Industry is against a new NRA."*

George L. Berry, co-ordinator for industrial operation, reports, on the other hand, a favorable attitude on the part of the industry. Mr. Bell states that a survey of chemical manufacturers showed that 96% of them were not in favor of a conference such as is proposed by Major Berry and were opposed to any movement for the setting up of a permanent agency of the nature of the defunct NRA. Co-ordinator Berry, in his reply, insists that he had received letters from 43 chemical manufacturers, of which 25 were favorable, 4 unfavorable and 14 noncommittal.

In conjunction with the current Bell-Berry correspondence, CHEMICAL INDUSTRIES' secret mail poll on NRA made in January of this year is of special significance. Of 657 firms in the various chemical process industries 88.2% stated that they were not satisfied with the working of the NRA. Half of them voted to abolish NRA entirely, 252 wanted to see NRA modified, and but 77 wanted to see it continued unchanged. Of companies that would be definitely classified as chemical manufacturers 65 voted to abolish it entirely, 10 to continue, and 36 to modify out of a total of 111.

### Berry Invites Leaders to Washington

Despite decidedly cold shoulder from leading associations and spokesmen for the textile, lumber, steel, automobile, chemical and other important industrial groups, Major Berry is planning to hold a national conference of industrial and labor leaders to discuss business recovery and trade standards in Washington on Dec. 9. Invitations to over 5,000 business and labor leaders have been issued, approximately 3,500 to industrial executives and the balance to labor representatives. According to figures released by Major Berry's office, of the 2,300 answers received from business leaders and trade associations 68% accepted, 23.1% were non-committal, and 8.9% were opposed, but about half of the latter group are said to have withdrawn their opposition when asked to reconsider.

General plan of the proposed conference is for a general meeting in the Federal Auditorium at 10 a. m., followed by about 60 different group meetings. Each group will be asked to select one representative to sit on what is expected to be called the Council of Industrial Progress. This council is to work for closer coordination of business and speedy recovery.

### "Intentionally Distorted"

Co-ordinator Berry denies that the government has any intentions of reviving the NRA or that the proposed conference is the 1st step in any such plan. Speaking before the Washington Society of Engineers on Nov. 20, Major Berry asserted that the purpose of the widely publicized meeting had been "intentionally distorted."

"I am in no way and no form whatsoever attempting to revive the NRA," said Major Berry. "In the letters I have received from thousands of substantial business men and labor leaders, I find a fairly general agreement that no further 'emergency' legislation is desired."

### Shortage or Exhaustion?

Out in Los Angeles, Nov. 13, President Axtell J. Byles of the strong American Petroleum Institute told members, gathered for the 16th annual meeting, to beware of "false prophets" who, he said, "are using warnings of petroleum scarcity for the purpose of frightening the people and their legislative representatives into federal control of this industry."

Refuting claims of certain trouble ahead, the fiery head of the A. P. I. threw down the gauntlet:

"So far ahead as the mind of man can run there is no possibility of a failure of the nation's supply of petroleum and its products . . . . there is every evidence that the supply of petroleum is adequate to meet requirements for generations, if not centuries." He added further that the government should not try to socialize the industry merely to serve the political bread line but should encourage the exercise of state powers to conserve crude oil and natural gas.

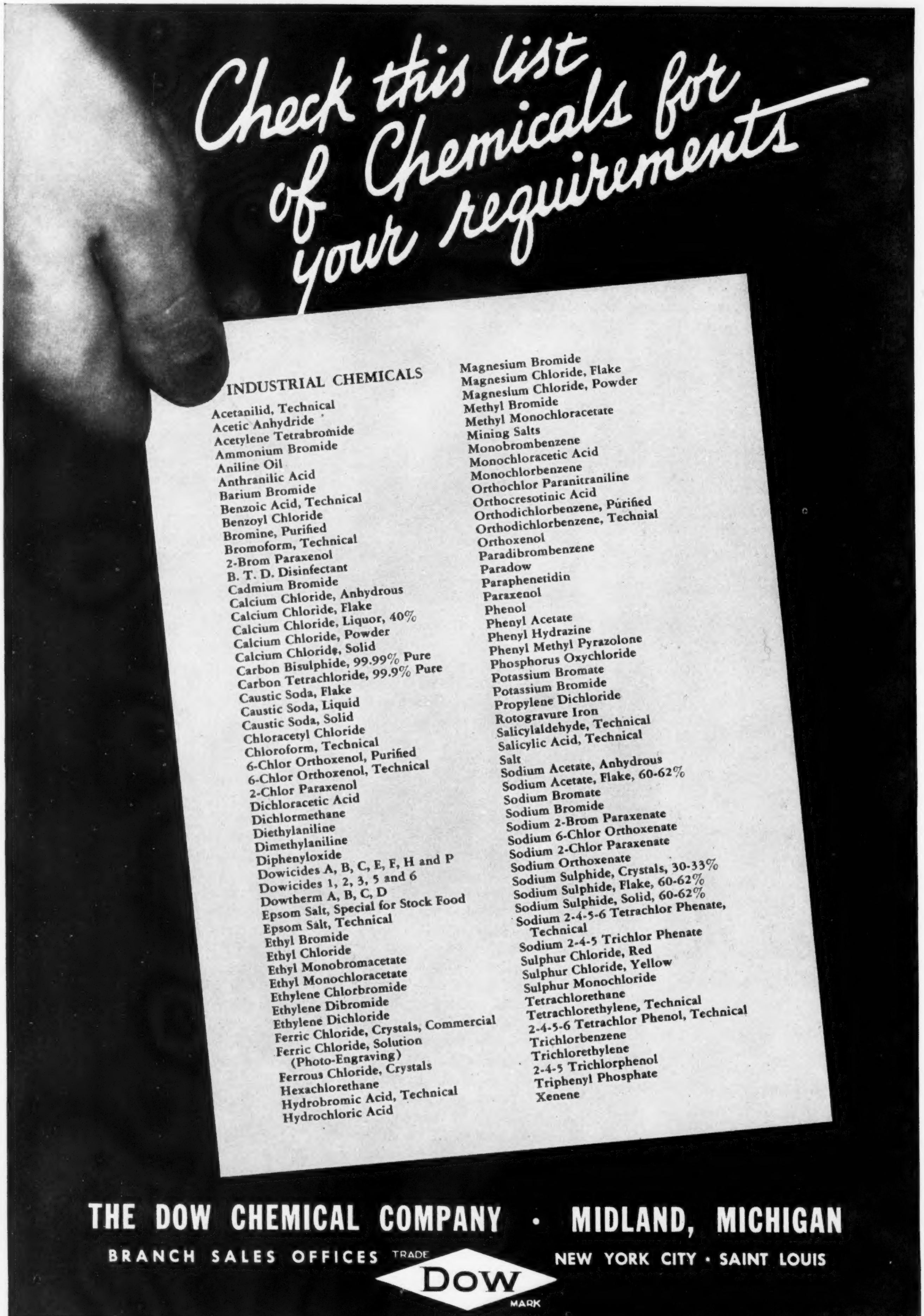
President Byles reported a survey recently completed by Institute committees, bringing to date a study made in '25, indicating proved oil reserves in the U. S. to exceed 12 billion bbls., or about twice the amount of '25 estimate despite that nearly 9 billion bbls. have been taken from the ground in the decade. Further, the A. P. I. head pointed to the latest reserves made possible by the hydrogenation of bituminous coal; the possibilities in the later use of shale; and the improvement in refining technique.

### "An Old, Old Story"

"Fears of petroleum shortage are as old as the industry," concluded President Byles. Former Tidewater head recalled to petroleum executives that such fears were heard within a few years after the drilling of the 1st Pennsylvania well.

### When Experts Fail to Agree

In sharp disagreement is Dr. Benjamin T. Brooks, outstanding petroleum tech-


Check this list of Chemicals for your requirements
INDUSTRIAL CHEMICALS
Acetanilid, Technical
Acetic Anhydride
Acetylene Tetrabromide
Ammonium Bromide
Aniline Oil
Anthranilic Acid
Barium Bromide
Benzoic Acid, Technical
Benzoyl Chloride
Bromine, Purified
Bromoform, Technical
2-Brom Paraxenol
B. T. D. Disinfectant
Cadmium Bromide
Calcium Chloride, Anhydrous
Calcium Chloride, Flake
Calcium Chloride, Liquor, 40%
Calcium Chloride, Powder
Calcium Chloride, Solid
Carbon Bisulphide, 99.99% Pure
Carbon Tetrachloride, 99.9% Pure
Caustic Soda, Flake
Caustic Soda, Liquid
Caustic Soda, Solid
Chloracetyl Chloride
Chloroform, Technical
6-Chlor Orthoxenol, Purified
6-Chlor Orthoxenol, Technical
2-Chlor Paraxenol
Dichloracetic Acid
Dichlormethane
Diethylaniline
Dimethylaniline
Diphenyloxide
Dowicides A, B, C, E, F, H and P
Dowicides 1, 2, 3, 5 and 6
Dowtherm A, B, C, D
Epsom Salt, Special for Stock Food
Epsom Salt, Technical
Ethyl Bromide
Ethyl Chloride
Ethyl Monobromacetate
Ethyl Monochloracetate
Ethylene Chlorbromide
Ethylene Dibromide
Ethylene Dichloride
Ferric Chloride, Crystals, Commercial
Ferric Chloride, Solution (Photo-Engraving)
Ferrous Chloride, Crystals
Hexachlorethane
Hydrobromic Acid, Technical
Hydrochloric Acid
Magnesium Bromide
Magnesium Chloride, Flake
Magnesium Chloride, Powder
Methyl Bromide
Methyl Monochloracetate
Mining Salts
Monobrombenzene
Monochloracetic Acid
Monochlorbenzene
Orthochlor Paranitraniline
Orthocresotinic Acid
Orthodichlorbenzene, Purified
Orthodichlorbenzene, Technial
Orthoxenol
Paradibrombenzene
Paradow
Paraphenetidin
Paraxenol
Phenol
Phenyl Acetate
Phenyl Hydrazine
Phenyl Methyl Pyrazolone
Phosphorus Oxychloride
Potassium Bromate
Potassium Bromide
Propylene Dichloride
Rotogravure Iron
Salicylaldehyde, Technical
Salicylic Acid, Technical
Salt
Sodium Acetate, Anhydrous
Sodium Acetate, Flake, 60-62%
Sodium Bromate
Sodium Bromide
Sodium 2-Brom Paraxenate
Sodium 6-Chlor Orthoxenate
Sodium 2-Chlor Paraxenate
Sodium Orthoxenate
Sodium Sulphide, Crystals, 30-33%
Sodium Sulphide, Flake, 60-62%
Sodium Sulphide, Solid, 60-62%
Sodium 2-4-5-6 Tetrachlor Phenate, Technical
Sodium 2-4-5 Trichlor Phenate
Sulphur Chloride, Red
Sulphur Chloride, Yellow
Sulphur Monochloride
Tetrachlorethane
Tetrachlorethylene, Technical
2-4-5-6 Tetrachlor Phenol, Technical
Trichlorbenzene
Trichlorethylene
2-4-5 Trichlorphenol
Triphenyl Phosphate
Xenene
THE DOW CHEMICAL COMPANY · MIDLAND, MICHIGAN
BRANCH SALES OFFICES
NEW YORK CITY · SAINT LOUIS
TRADE DOW MARK

A. P. I.'s BYLES CONSULTANT BROOKS

*They focus attention once again on the question of the probable life of our precious crude oil reserves.*

nologist. In a discussion on "Trends of the Petroleum Industry" at Yale University, Consultant Brooks referred to a critical survey of our petroleum reserves and ways of alleviating a petroleum shortage, made by Dr. L. C. Snider, geologist of Cities Service, and himself. Dr. Brooks charged that fear of government interference in the petroleum industry had placed a taboo on the discussion of petroleum shortage.

He pointed out that the rapid findings and consumption of oil, made possible by deeper drilling and improved geological methods of prospecting have only hastened the petroleum shortage. While complete exhaustion would not be reached for many decades, a shortage of petroleum produced in the U. S. is expected to be reached in 5 to 8 years. "Some companies," stated Dr. Brooks, "believe that shortage is only a matter of a few years and have acted upon this belief in a strenuous effort to build up their reserves. Shortage will bring higher prices, which will be a boon to those companies that have reserves of crude oil underground. "Shortage sooner or later will also bring in the use of substitutes, the manufacture of which will become advantageous with higher prices. These substitutes include oil made by the hydrogenation of coal, already being done in England and Germany with government subsidies."

**But They are Substitutes**

Shale oil also can be produced, Consultant Brooks told his Yale listeners, but at higher prices, and, furthermore, the speaker pointed out, these will be new industries for the U. S. They are distinctly petroleum substitutes, he maintained.

**A Matter of Definition**

Controversy centers about the words 'shortage' and 'exhaustion,' Dr. Brooks maintaining no immediate likelihood of exhaustion, but definite danger of lack of adequate supplies. A. P. I.'s Byles, in his Los Angeles speech, employed both terms rather indiscriminatingly. Undercover, informed petroleum experts are saying the possession of or lack of possession of huge petroleum reserves by the various petroleum refineries is the real "nigger-in-the-pile" in the present controversy. Current dispute really started last spring when Dr. Brooks was unexpectedly detained from the August Meeting of the A. C. S. at San Francisco and was, therefore, unable to read a paper he had planned to deliver on the subject of petroleum shortage. A revision of this paper of Dr. Brooks' was recently printed in a southern refinery journal, the *Oil Refining Journal.*

**Foundation Supplies Publicity**

The Chemical Foundation has now published Dr. Brooks' Yale address in booklet form and are reported to be mailing it to a selected list of 50,000.

## Obituaries

### ¶"Joe" Turner, One of the Remaining "Chemical Merchants," is Dead—NFA Leader Dies on Eve of Convention—Other Deaths—

Joseph Turner, 67, head of the chemical jobbing firm, Joseph Turner & Co., N. Y. City, died suddenly of a heart attack Nov. 17, at his home in Ridgewood, N. J. His death came unexpectedly since he

JOSEPH TURNER

was in fair health, and was planning his early retreat to his fishing place on Long Key, Fla. He was one of the very few remaining chemical "merchants" of the old school. Those he liked knew it at once from the twinkle in his eye, and the proffering of one of the famous Turner cigars; those he disliked were not kept in the dark for brutal frankness was one of his outstanding characteristics. He was one of the best informed men on the merchandising of chemicals in this country. He played a lone hand with consummate skill. "Joe" Turner was born in England in 1870, and came to this country as a young child. Aged 11, he became office boy in the old chemical jobbing house of F. L. and D. S. Riker where he rose steadily until he became general manager early in the century. In '22 when the Rikers retired, he bought their interests, forming the company that bore his name. It was highly characteristic that when the "trek" of chemical companies started from downtown he clung tenaciously to his one address for 52 years, 19 Cedar st., and it was only within the past 2 years that the tidal wave of insurance companies drove him to 500 5th ave. In recent years he relinquished many duties to his son-in-law, Walter Merrill and to Harold Fyffe, devoting more and more time to fishing at his winter home at Long Key or his summer place on the south shore of Long Island. His grandson was almost his constant fishing companion. Surviving are his wife, Georgette MacKay Turner, a daughter, Mrs. Dorothy T. Merrill, and 2 grandchildren.

**Melvin Dies at Critical Period**

The American fertilizer industry suffered a tremendous blow on Nov. 19 when President C. T. Melvin of the N. F. A. died unexpectedly. Members attending the Atlanta convention, while acquainted with the fact that Mr. Melvin was ill and unable to attend, were totally unprepared for the tragic news when it was announced on the floor of the meeting.

Chester Thomas Melvin was born Oct. 19, '83. He was for the most part self-educated. From '09 to '19 he was secretary of the Imperial Company of Norfolk.

C. T. MELVIN

In the latter year he joined the sales staff of the V. C. as assistant division manager at Savannah. The next year he became

division manager at Albany, Ga., and went to Jacksonville as manager for Florida in '23. Following year he was elected vice-president of Gulf Fertilizer of Tampa. Mr. Melvin was also president of Peninsular Chemical of Orlando, and of Tampa Pine Products and Chemical. He was a Mason and a Rotarian, a member of the U. S. Chamber of Commerce, of the Florida State Chamber of Commerce, of the Tampa Board of Trade, and Manufacturers' Association. He was a member of the Tampa City Club and of the Palm Ceia Golf Club. Among his hobbies were social service, his flower garden, and photography.

Mr. Melvin had long been active in N. F. A. For a number of years he was a member of the Soil Improvement Committee of The National Fertilizer Association. In June, '33, he was elected vice-president, and in June, '35, president. He was president of the Independent Fertilizer Manufacturers' Association for several years. He was a member of the original Fertilizer Recovery Committee which began work on drafting the Code of Fair Competition in the latter part of May, '33, prior to the passage of N.I.R.A. He served on the Administrative Committee, was vice-chairman of the Fertilizer Recovery Committee, and chairman of the Zone 7 Executive Committee in '33 and '34.

Mr. Melvin was deeply interested in studying the effects of fertilizers on crops both from the scientific and practical points of view. He was very largely responsible for the organization of the Florida Agricultural Research Institute, 3 years ago, and served until recently as its president. His death represents a tremendous loss to his Company, to the Association, and to the industry as a whole.

**Lea, Sergeant President Dies**

Joseph Tatnall Lea, Sr., 59, president of E. M. Sergeant Pulp & Chemical, in N. Y. City, following 5 weeks illness, on the 12th. Mr. Lea had been Sergeant president for many years.

**Other Deaths of the Month**

Edgar B. Stevens, 73, retired research chemist, founder of Niagara Research Laboratories, and former Wood Products president, in Buffalo, on Oct. 29. Mr. Stevens was noted as the inventor of first wood alcohol distillation process. He has been a U. S. I. director since that company took over Wood Products, and though retired from active work for nearly 10 years, he has maintained a private laboratory in his home.

The "eternal triangle" is held responsible for the murder of Dr. Fritz Gebhardt, 42, in N. Y. City, Nov. 12. Gebhardt, brilliant young chemist, was one of Max Haber's crafty assistants previous to the World War, aiding in the development of the Haber fixation process, but abandoned a promising chemical career for business and finance.

Henry Durell Crippen, 59, former president of Bon Ami, in Nyack, N. Y., Oct. 25.

Amos L. Allen, 40, chief chemist at General Electric's Pittsfield, Mass., works, and winner of Charles A. Coffin Foundation Award in '29, on Oct. 30.

Joseph J. Hall, 79, for 50 years plant supervisor for Rubber Regenerating Co., now part of Naugatuck Chemical, in Naugatuck, Conn., on the 5th. Mr. Hall retired several years ago.

Frazer M. Moffat, 67, president of the Tanners' Council of America and prominent in tanning industry, of a heart attack, on the 7th. He is survived by his wife, a daughter, and a son, Frazer M. Moffat, connected with U. S. I.

Dr. Max Henius, 76, president of Wahl-Henius Chemical Laboratory & Brewing Institute of Chicago, internationally known brewing expert, and most prominent figure in Danish-American co-operation, in Jutland, Denmark, the 15th.

William George, 42, employee at R. & H. Chemicals, Niagara Falls plant, from burns caused by overflow of hot sodium from tank, 19th.

## *COMING EVENTS*

**Exposition of Chemical Industries, Grand Central Palace**, N. Y. City, Dec. 2-7.

**Ceramic Society of New Jersey**, Annual Meeting, New Brunswick, N. J., Dec. (exact date not announced).

**American Society of Agronomy**, Annual Meeting, Chicago, Dec. 5-6.

**American Association of Textile Chemists and Colorists**, Annual Meeting, Chattanooga, Tenn., Dec. 6-7.

**National Association of Insecticide & Disinfectant Manufacturers**, Waldorf-Astoria, N. Y. City, Dec. 9-10.

**General Mid-Continent Oil & Gas Association**, Annual Meeting, Board of Directors, Tulsa, Okla., Dec. 10 (tentative).

**Sixth National Organic Chemistry Symposium**, Rochester, N. Y., Dec. 30.

**National Shoe Retailers Association, and National Boot and Shoe Manufacturer's Association**, Joint Convention and Style Show, Chicago, Ill., Jan. 6-9, 1936.

**National Association of Dry Cleaners**, Annual Convention, Washington, D. C., Jan. 14-16, 1936.

**National Crushed Stone Ass'n, National Sand and Gravel Ass'n, and National Slag Ass'n**, meeting concurrently, Hotel Jefferson, St. Louis, Mo., week of Jan. 27, 1936.

**Fourth International Heating and Ventilating Exposition**, International Amphitheatre, Chicago, Jan. 29-31, 1936.

**Sixth Packaging Exposition**, Hotel Pennsylvania, N. Y. City, Mar. 3-6, 1936.

**American Society for Testing Materials**, Regional Meeting, Wm. Penn Hotel, Pittsburgh, Mar. 4, 1936.

**American Association of Petroleum Geologists**, 21st Annual Meeting, Tulsa, Okla., Mar. 19-21, 1936.

**American Ceramic Society**, 1936 Annual Meeting, Columbus, Ohio, Mar. 29-Apr. 4.

**American Chemical Society**, 91st Meeting, Kansas City, Mo., Apr. 13-17, 1936.

**National Petroleum Association**, Semi-Annual Meeting, Cleveland Hotel, Cleveland, Apr. 16-18, 1936.

**Natural Gasoline Association of America**, Mayo Hotel, Tulsa, Okla., May 13-15, 1936.

**International Petroleum Exposition and Congress**, Tulsa, Okla., May 16-23, 1936.

**American Association Cereal Chemists**, Annual Meeting, Adolphus Hotel, Dallas, Tex., June 1-5, 1936.

**American Water Works Association, Annual Convention**, Biltmore Hotel, Los Angeles, Cal., June 8-12, 1936.

**Chemical Engineering Congress**, Central Hall, Westminster, England, June 23-27, 1936.

**American Chemical Society**, Semi-Annual Meeting, Pittsburgh, Sept. 7-12, 1936.

**LOCAL***

Dec. 12. N. Y. Paint, Varnish & Lacquer Association (location to be announced).

Jan. 10, 1936. N. Y. Section, A. C. S., Perkin Medal, Joint Meeting with Society of Chemical Industry.

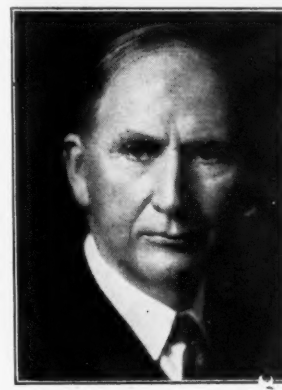
Feb. 7, 1936. N. Y. Section, A. C. S., Regular Meeting.

* Meetings held at Chemists Club unless otherwise noted.

# Associations

***¶Ittner, Zeisberg, and DeLong Honored by Fellow "Chem. Engineers"—Alliance Re-elects Directors and Officers — Consultants Seek Definition of "Scientific Opinion" — Other Association Treasurership Briefs—***

Dr. Martin H. Ittner, soap technician and Colgate-Palmolive-Peet chief chemist, will head the A. I. Ch. E. in '36. For many years he has zealously and effectively guarded the Institute funds in his treasurership position. He will succeed the well-known consultant, A. E. Marshall, on Jan. 1.



DR. MARTIN H. ITTNER

*Colgate's head researcher new A.I.Ch.E. leader.*

Elected with Dr. Ittner at the recent Columbus meeting were:—The new vice-president, Fred C. Zeisberg, connected with the Technical Investigation and Development Department of du Pont, and last year's chairman of the local committee of Wilmington chemical engineers who entertained the Institute in Wilmington. Mr. Zeisberg has for several years been a director of the Institute.

Frederic J. LeMaistre, Philadelphia, consulting chemical engineer, was re-elected secretary. Charles R. DeLong of N. Y. City, who is associated with Mutuelle Solvay of America, was elected treasurer.

Four new directors, representing various sections of the country where the Institute is most active, were also elected. Their names and connections follow:

Dr. Edward Bartow is head of the Department of Chemical Engineers at the University of Iowa, Iowa City, Iowa. Dr. Gustav Egloff of Chicago is associated with Universal Oil Products.

Prof. Albert B. Newman is on the Chemical Engineering Staff of Cooper Union, N. Y. City; while James J. Vail of Philadelphia is vice-president and chemical director of Philadelphia Quartz.

**June in London**

Election of these officers and directors for next year is of more than usual importance to the Institute since it will be under the leadership of these men that the Institute's members will journey next June to England for a joint meeting in London with the Institution of Chemical Engineers of Great Britain, which occupies in England and the Continent the same position as the Institute in this country and Canada.

This trip abroad is a return visit to those British chemical engineers who in '28 visited the U. S. as guests of the American chemical engineers and made a 3 weeks' inspection trip of important chemical engineering centers in the U. S. and Canada.

For a summary of the important papers delivered at the Columbus meeting turn to page 573 of the Plant Operation and Control Section.

## Alliance Leaders for '36

All of the directors of the Chemical Alliance were re-elected at the meeting held on Nov. 4. On Nov. 20 the officers were re-elected.

In accordance with recommendation made by the M. C. A., directors amended article I of the constitution of the Alliance to state the purpose to be "to promote in all lawful ways the general welfare of the chemical industry of its members." Purpose formerly was stated "to provide for carrying out the purposes of the National Industrial Recovery Act."

## Defining "Scientific Opinion"

At the annual meeting of the Association of Consulting Chemists and Chemical Engineers, Inc., held Oct. 22, several members brought up the definition of the term "scientific opinion" employed in the Copeland Bill. In this Bill the term "scientific opinion" is defined as "the opinion, within their respective fields, of competent pharmacologists, physiologists, or toxicologists." Believing that this definition is so inaccurate and narrow that it is unjust to other scientific workers and that, moreover, it is not in the public interest because it tends to prevent proper enforcement of the food and drugs act, the Association adopted a resolution in which it is suggested that in place of the present definition the following be substituted:—"Scientific opinion is the opinion, within their respective fields, of competent specialists in the basic or applied sciences."

The Association is inviting support of other scientific organizations and of any individuals or groups interested in seeing that the term "scientific opinion" is properly defined.

## Coming Gastronomic Thrill

The Chemical Salesmen's Association held a highly successful "Fite Night" Nov. 13 at the Downtown Athletic Club. Members will be asked to vote on several amendments to the constitution which will bring that instrument more up-to-date on the occasion of the annual meeting, date of which has not been definitely set, but which will be held early in December. Preparations for the annual Christmas Party are now under way, and an attendance of 300 or more is expected.

## Assuring "Cool" Deliberation

The '36 annual meeting of the American Association of Cereal Chemists will be held in Dallas, on the tentative dates of June 1 to 5, inclusive. Definite arrangements have been made to hold the meetings at the Adolphus Hotel. Meetings will be held in an air conditioned room equipped with a loud speaker system. Plans are already under way to make this one of the most successful and unique annual meetings ever held by the A. A. C. C. June 5 will probably be selected as the closing date of the meeting in order that those present who may wish to do so, will have an opportunity of attending the official opening of the Texas Centennial.

## Looking for a Luncheon Place?

Drug & Chemical Club, well-known downtown N. Y. City luncheon rendezvous of chemical executives, suspends initiation fee in drive for new members. Popular Frank J. McDonough, N. Y. Quinine & Chemical president, heads the committee.

## Not as Simple as it Sounds

Dean Frank C. Whitmore of Penn State, one of the original group of consulting editors for Chemical Industries, discusses "Some Simple Aliphatic Chemistry" on Dec. 19 at the Franklin Institute before the Philadelphia Section, A. C. S. Present increased interest in industry in aliphatic chemistry as distinct from the old coal tar chemistry is being reflected in several American universities. One of the leaders in this field is Penn State with 30 research chemists working with Dr. Whitmore.

## Pittsburgh A.I.Ch.E. Section

Pittsburgh Section of American Institute of Chemical Engineers is organized with Edward E. Marbaker, Mellon Institute, as chairman; Junius D. Edwards, Aluminum of America, vice-chairman; and W. W. Duecker, Mellon, secretary-treasurer.

## Stainless Steel's Place in Textiles

George W. Hinkle, Republic Steel, speaks on "Stainless Steel in the Textile Industry" before Piedmont Section, American Association of Textile Chemists & Colorists, in Charlotte, N. C. Following address, members view Republic's sound film, "Enduro, Republic's Perfected Stainless Steel."

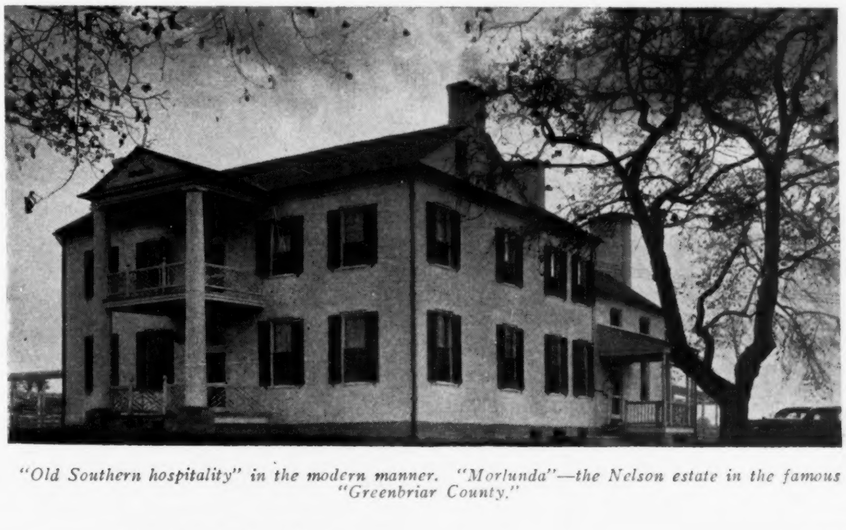
# Personal

***¶Bell to Raise Republican '36 War Chest—Nelson, United Carbon, Host to 540—Douglas Flays "New Deal" Financing — Reese Shows Embryo Scientists About Wilmington's Chemical Industry***

President William B. Bell, of Cyanamid, who openly has been a severe critic of many of the "New Deal Experiments," will head a group of industrialists and lawyers who will raise funds for the Republicans in the important '36 presidential campaign. Announcement of his appointment was made by Chairman Fletcher of the Republican National Committee on Nov. 20.

## The "500" Meet at "Morlunda"

One of the most coveted invitations to members of the paint and rubber fields is that issued annually by United Carbon's genial president, Oscar Nelson, to join his "round-up" held jointly at "Morlunda," his famous estate in celebrated Greenbriar County, W. Va., 2½ miles



*"Old Southern hospitality" in the modern manner. "Morlunda"—the Nelson estate in the famous "Greenbriar County."*

west of Lewisburg on the Midland Trail, and at the popular White Sulphur Springs, a few miles away.

Mr. and Mrs. Nelson were host and hostess to 540 of the "Who's Who" in the principal carbon black consuming fields Nov. 9-10. Highlights of the 5th annual gathering were the tour of the United Carbon's Charleston plant, conducted by Chief Chemist Roberts, the week-end sports at "Morlunda," and the banquet at the Greenbriar. A very tired but happy group trouped aboard a 14 car special at Charleston late Sunday evening for the return to Akron, Detroit, etc. Foreign guests included 20 from Canada, 3 from England, and 1 from France.

### Douglas, "Treasury Watch-dog"

In a recent editorial the conservative *Financial Chronicle* stated that Lewis W. Douglas, along with Senator Carter Glass, deserved to be called the "watch-dogs of the Treasury."

But while the venerable Senator from Virginia is resting in an effort to gain sufficient strength for the next session, the youthful former budget director day in and day out is driving home to all types of audiences all over the country the perils of inflation.

Before the Academy of Political Science last month Mr. Douglas condemned the process of unloading government bonds on to the banks, terming such action "just as inflationary as the emission of paper money although it lead to credit inflation rather than currency inflation." The Cyanamid V.-P. told his audience that a wise relief policy could have been instituted that would have permitted the balancing of the budget without permiting destitution and starvation.

### Seeing Chemistry in Action

Chemical Wilmington was host to 25 University of Virginia students in a 2 day visit to various laboratories in the vicinity. Dr. Charles L. Reese, class of '83, is the oldest alumnus of the university connected with du Pont, and Henry Cadot, class of '35, youngest alumnus connected with the company. Fred C. Zeisberg and Prof. Hitchcock of the University also spoke.

### Mainly About People

"Steel Alloys" will be discussed by Director of Research Johnson, U. S. Steel, and H. W. McQuaid, Republic Steel, at a meeting sponsored by the American Institute at the auditorium of Metal Products Exhibits, Rockefeller Center, N. Y. City, Dec. 13, at 8 P. M.

H. H. Leonard, president, Consolidated Packaging Machinery, Buffalo, now heads the Packaging Machinery Manufacturers' Association. Annual meeting was held at Briarcliff Lodge, N. Y., Oct. 31-Nov. 1.

Pierre S. du Pont spoke briefly at the dedication of the new $2,000,000 high school named in his honor. Mr. du Pont in the past 20 years has given more than $8,500,000 for education in his home state.

"Soaper" R. R. Deupree, P. & G. president, is a director, Cincinnati & Suburban Bell Telephone.

Sales Manager Zirlin, Marine Laboratories, water treatment experts, reports, as he returns from an extended trip, a more optimistic outlook in many business centers of the mid-west and Pacific Coast.

Midland club women heard last month Mrs. James T. Pardee, wife of Dow's board chairman, relate the details of the recent trip made by her and her husband to the land of the midnight sun.

Robert C. Stanley, president of International Nickel since '22, is now on G. E.'s directorate.

New Chemists' Club (N. Y.) members include George O. Richardson, manager, special products division, National Aniline & Chemical; Carl Iddings of Casein Manufacturing; G. Lee Camp, Monsanto V.-P.

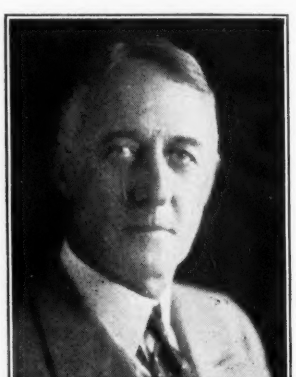
Dr. Frederick L. Hoffmann, for many years statistician for Prudential Insurance, and at present a member of the Cancer Research Division of the University of Pennsylvania, has just presented 200 bound volumes on general and industrial hygiene to the Haskell Laboratory of Industrial Toxicology of du Pont's.

Williams Haynes, publisher of CHEMICAL INDUSTRIES, will deliver the Brackett Lecture before the school of engineering and chemistry at Princeton on Dec. 10th. His subject: "Synthetic Raw Materials."

## Personnel

***¶Now Board Chairman Burgess —Three New Sales Managers Appointed—Rubber Expert Henderson Heads New Cyanamid Dept.—Du Pont Shifts London Personnel—Other Changes—***

Marking the close of 25 years of its corporate existence directors of C. F.



C. F. BURGESS

Burgess Laboratories have created the position of chairman of the board and the founder of the company will assume the new office. Arba B. Marvin becomes the new president.

### Borax, Potash, and Ash

American Potash & Chemical, 70 Pine st., N. Y. City, announces appointment of William J. Murphy as sales manager.

WILLIAM J. MURPHY
*A quarter of a century of service.*

Mr. Murphy has been with the corporation for 25 years. Previous to assuming his new responsibilities, he was in charge of the borax sales division and was actively engaged in potash sales work. In the capacity of sales manager, he will now have general charge of sales of all of the Corporation's products.

### Another 25 Year Man

Mallinckrodt's new general sales manager is M. A. Frohock, assistant secretary-treasurer since '25. An accountant and industrial engineer by training, he joined the Mallinckrodt organization in '10 after several years of well-rounded experience in sales, accountancy and engineering. In '11, he was appointed chief accountant; in '20, assistant secretary; in '25, assistant secretary and treasurer; and in '25 was elected a member of the board of directors.

### Stevenson Returns to N. Y.

Ralph M. Stevenson is new Givaudan-Delawanna sales manager. He was formerly in charge of Givaudan sales for the Detroit area.

### Also Chemicals for Rubber

B. W. Henderson, sales manager of the Crude Rubber Department of Cyanamid & Chemical, has been placed in charge of the sales of rubber chemicals to the rubber industry as well as crude rubber. Department will be known as the "Rubber and Rubber Chemicals Department."

### Now President Saklatwalla

R. D. Saklatwalla, former Vanadium Corp. vice-president, is now president of U. S. Rustless Iron & Steel.

### Glass to African Metals

Charles Glass, formerly with Pfaltz & Bauer, and previously sales manager for John C. Wiarda (now a Cyanamid unit),

and before that with Wilson Chemical, is now with the chemical department of African Metals, N. Y. City.

### Du Pont's English Office

Homer H. Ewing, du Pont's London office manager for the past 5 years, will be transferred to Wilmington as assistant director of development, R. & H. Chemicals Department.

Henry E. Ford, now assistant office manager in London, will succeed Mr. Ewing as European representative.

Caesar A. Grasselli, II, will be transferred from the development department to become assistant manager at the London office.

Charles B. McCoy has been transferred from the purchasing department to the London office.

Harry J. Haon, Jr., will be transferred from the London office to Wilmington for technical sales service work in the fabrics and finishes department.

### Others in New Fields

N. E. Dabolt, formerly general manager of the Zapon Co., lacquers and finishes producer, is appointed metropolitan sales manager in charge of the N. Y. City office, 547 Greenwich st.

William Bain, formerly chief research chemist with British Belting & Asbestos and an officer in the British Society of Chemical Industry, moves to Charlotte, N. C., to become Scandinavia Belting manager.

International Agricultural merges Raleigh and Henderson, N. C., offices, Raleigh office to be headquarters for North Carolina and Virginia. W. L. Harris is in charge.

Joseph Stranad will watch credits for Titanium Pigment. He was formerly with Eagle Picher Lead.

## Litigation

***¶Catalin Wins Again in Higher Court — Lever Obtains "Lifebuoy" Protection — Phosphate Recovery Sues — Miller Appeals $700,000 Personal Liability Decision—***

Catalin announces that the U. S. Circuit Court of Appeals in N. Y. City has affirmed an earlier decision of the District Court of Brooklyn holding that the basic patent of the Catalin Corporation of America was valid and had been infringed. Opinion was written by Judge Learned Hand. Defendant was the Catalazuli Manufacturing Co. Officials of the Catalin company state that the patent which was declared valid and infringed covers all of the essential steps in the production of Catalin.

N. Y. Supreme Court rules in favor of Lever Bros. in their suit to prevent J. Eavenson & Son, Camden, N. J., from producing soap in unfair competition with Lever's well-known "Lifebuoy" product. Injunction fully protects style, dress, color, and appearance.

### Concentration of Metals

A patent for the concentration of metals is involved in a suit of Phosphate Recovery against Southern Phosphate. Case is before Judge John P. Nields in the U. S. District Court at Wilmington, Del.

### A Question of Personal Liability

C. Wilbur Miller, former Davison Chemical head, is appealing before the U. S. Court of Appeals ruling of a lower court holding him liable to the receivers of Davison Realty for more than $700,000, principal and interest on promissory notes held by the receivers. Attorney for Miller argued that the federal court lacked jurisdiction, and that the promissory notes did not form a personal obligation against his client.

## Plants

***¶Calco Loses Tax Appeal — Mutual and Mallinckrodt More Fortunate—Interesting Order in Plant Inspection—***

Calco loses in appeal to Essex County, N. J., Tax Board for reduction in assessment value of certain meadow land properties.

Both Mutual Chemical and Mallinckrodt were more fortunate in Jersey City, a half million slash being granted the former on land, personality, and buildings, while the latter obtained a $100,000 drop in assessment.

### Can Inspect But One Room

Justice Thomas H. Noonan, N. Y. State Supreme Court, granted a motion last month for a court order for the inspection of Mathieson Alkali's Niagara Falls plant, made by Attorney W. L. Clay in behalf of a client, a former employee of the company, who lays claim to having developed silicosis.

Judge Noonan made certain reservations asked for by the defense counsel, directing that the inspection be confined to the room in which the complainant worked and that it be made in the presence of defense counsel, engineers and chemists.

### "Checked at the Plant Gate"

Du Pont will distribute nearly $700 in prizes to plant workmen with the most attractive gardens competing in the annual Penn Grove Village contest.

Frank Scrudato, former employee, sues Mutual Chemical for $25,000, claiming serious injury as result of chemicals used at the Jersey City Works.

Tubize, which for more than a year and a half has been operating only the viscose dept. at the Rome works, is now putting into operation machines in the acetate dept.

## Companies

***¶United Carbon Increases Plant Capacity — Catalin Production Up 50% — Thompson-Hayward Moves to Larger New Orleans Quarters—***

Completion of 2 new units by United Carbon will increase the daily productive capacity of carbon black plants in the

UNITED CARBON'S NELSON
*Last month—540 old friends and 3 new production units.*

Texas Panhandle to 485,000 lbs. from the present total of approximately 380,000 lbs. United Carbon started production early in November at 3 of 5 new units, and construction of the remaining 2 will be finished shortly.

### Catalin Will Fabricate

Catalin, which 5 years ago began a search for fresh sources of revenue from new markets, announces that its '35 production will approximate 4,000,000 lbs., a 50% gain over '34. For the 1st 9 months production exceeded 2,600,000 lbs. and, it was said, 4th quarter production will surpass 1,000,000 lbs.

Corporation announces organization of Fabricated Catalin, Inc., which will operate as an independent company in manufacturing Catalin plastic into finished form.

Catalin Corp. of America reports for quarter ended Sept. 30th, profit of $104,-998 after charges and depreciation, but before federal taxes, comparing with profit of $59,045 in 3rd quarter of '34.

### Keeps Pace with Southern Growth

The Thompson-Hayward Chemical Co.'s New Orleans branch is moving into much larger quarters at 1055 Constance st. Says President Thompson: "We are striving to keep pace with the growth and needs of a great metropolis of the South, gateway to the Middle West, our many customers in the territory, and those we hope to secure."

### "Flickers" of Stoneware

During Chemical Exposition Week, U. S. Stoneware officials will show in their hotel suite at the Hotel Lexington, Lexington ave. and 48th st., a new mov-


"THROW ANOTHER LOG on the FIRE"
To the bright glow of other Christmas greetings, Mallinckrodt extends to their many friends warm wishes for a cheery Yuletide season and a New Year of health and prosperity. Many, many thanks for your continued good will and co-operation.
Mallinckrodt
CHEMICAL WORKS
Fine Chemicals for
MEDICINAL
Photographic, Analytical and Industrial Uses
ST. LOUIS • PHILADELPHIA • CHICAGO
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ing picture film entitled "Flexlock,—the Wonder Pipe Joint." "Flexlock" Joints were developed by B. F. Goodrich Co.—and their adaptability for use with chemical stoneware bell-and-spigot piping was worked out in cooperation with The U. S. Stoneware Co.

### Merck Salesmen Confer

Headed by Dr. John L. K. Snyder the Merck industrial sales force held a 2 day meeting at Rahway last month. More than 60 from all parts of the country attended.

### Foxboro Acquires New Unit

Famous Foxboro trade-mark, known throughout the world as covering the highest quality of instruments for recording, controlling and indicating temperature, pressure, flow and level, has not been quite so well known in some of the other measurement fields, such as humidity or thicknesses of materials.

Realizing importance of these measurements, Foxboro has acquired an interest in Atlantic Precision Instrument, Malden, which manufactures the Verigraph, an electrical device which determines and controls moisture content of paper—also thickness of dielectric material, such as rubber—and which has already proved its great value in the production of paper and rubber goods.

### For Closer Cooperation

Babcock & Wilcox, to provide a closer contact between customer and plant, has transferred from Atlanta to the Works at Augusta, Ga., the refractories division sales office for the Southeastern District.

### New Fansteel Metallurgical

Former Fansteel Products Co. changes corporate name to Fansteel Metallurgical Corp. New name indicates no change in corporate structure or organization.

### New Companies Announced

Alho Chemical is organized in Philadelphia for manufacture and distribution of chemical products. Headquarters are at 2946 N. 5th st. with A. H. Owens in charge.

Robert E. Grenette and associates organize The Grenette Chemical Co., with headquarters at 1722 Vine st., Philadelphia.

### Du Pont Wilmington Notes

Du Pont leases 2-story building at 619-621 Peachtree st., Atlanta, Ga., and a one-story building adjoining in rear of 100 North ave. Lease is for 10 years at straight rental of $100,000.

There is a lot of interest in the du Pont Wilmington circle in the du Pont Bowling League.

### Viscose's Labor Troubles

Labor difficulties cause shutdown of one unit at Viscose's Nitro, W. Va., plant. About 144 men are involved in what labor leaders call "a preliminary move" toward wage settlement.

### Relief Committee in New Role?

There is now a movement on foot in N. Y. City to place the Committee on Unemployment and Relief for Chemists and Chemical Engineers on a permanent basis.

In discussing plans to carry on the Committee's work, George F. Hasslacher at a recent meeting of the Committee suggested that the Committee could be a valuable center of general information to the chemical industry and become a clearing house for positions open and men suitable for them. Concerning the change in nature of the work of the Committee, he stated that he felt that the present unwieldy name should be changed to a more informative one. The Committee asks suggestions for an appropriate name.

In supporting Mr. Hasslacher's suggestion, James A. Lee (*Chem. & Met.*) stated that this is an opportune time for the Committee to be made permanent and he felt that it would serve a valuable purpose in securing knowledge regarding unemployment and other human factors in the chemical profession.

Dean W. T. Read, of Rutgers, stressed the necessity of having a place where chemists and chemical engineers could secure advice. He also mentioned the service such an institution could render to the older men. He felt that a non-partisan organization, sponsored by all technical societies, could attack the problem more effectively than any present individual society.

Dr. Arthur W. Hixson of Columbia reported that there must be at least 50,000 chemists and chemical engineers related to the chemical profession in the country. He felt that the organization now proposed would render advisory service to chemists and serve as a useful medium to the educational institutions, the industry and the men seeking employment. Studies conducted by the Committee in relation to jobs available and the personnel (their education, etc.) suited for same would be very useful in finding methods to reduce unemployment in the profession. A sub-committee consisting of A. A. Backhus (U. S. I.), Lee, ("*Chem & Met*") Winship (representative of the Electrochemical Society) with Frank G. Breyer, chairman of the Committee, was appointed at the meeting to make recommendations on the Committee's future plans.

### "Eves"-Dropping at the Chemists' Club

A Chemical Industries reporter standing near the registration booth at the recent presentation of the Society of Chemical Industry Medal to Mellon's Weidlein at the Chemists' (N. Y.) Club, overheard one woman remarking to another, "No one even knows there is such a thing as a woman chemist."

Editorially curious, your reporter discovered that for the 1st time women's place in chemistry will be the subject of a symposium held in conjunction with the Chemical Exposition. Rutgers' Dean Read will preside at the meeting, scheduled for the Grand Central Palace, Dec. 7th, 2.15 P. M.

EXPOSITION MANAGER ROTH

*Women chemists—German visitors—"Standing Room Only."*

Florence E. Wall, F. A. I. C. consulting chemist, author and lecturer, well known for her active interest in professional education and vocational guidance, will be chairman of this special program. It is planned to cover teaching and hospital work; scientific and technical advertising, editorial work, and publicity; and several of the newer fields—textiles, cosmetics, germology, public health, etc.,—in which women trained in chemistry have shown particular aptitude and found success. An attractive group of speakers male and female, will address the meeting.

Germany, often referred to as the cradle of modern industrial chemistry, has sent 32 of her most prominent chemists to view the '35 exposition. Party, which arrived on the crack *Europa* on Nov. 25, will, in addition to covering the "show," visit a number of the American chemical centers.

For the 1st time in many years the "All Sold Out" sign has been resurrected by the exposition managers. Story is circulated that one of the publicity experts retained by the management could not get a booth for his firm. Former attendance records are expected to be shattered during the week of Dec. 2.

## *Incorporations*

The Lincoln Chemical Co., Columbus, Ohio. Capitalized at 250 shares, no par value. Chartered by Rosalind Diaegin, M. J. Diaegin, and George N. Seltzer.

The Moseley Chemical Co., Lexington, Ky. Capitalized at $2,000. Chartered by C. L. Moseley, M. K. Eblen,, and Helen C. Eblen.

Muskegon Tanning Co., Muskegon, Mich. Capitalized at $150,000. Chartered by M. L. Rogers, L. A. Irwin, and M. A. Desmond, all of Wilmington, Del.

Northwestern Chemical Industries, Inc., Seattle, Wash. Capitalized at $48,000. Chartered by H. D. Perdang, H. B. Wrenn, and H. W. Smith.

Peter Manufacturing Corp., Wilmington, Del. Capitalized at $500,000. Chartered by M. L. Rogers, L. A. Irwin, and M. M. Nichols.

Peterson Chemical Corp., Manchester, Conn. Capitalized at $50,000; par, $100. Chartered by Harry L. Peterson, Myer Sanders, and Clarence E. Peterson.

# Washington

***¶Chemicals in the New Trade Pact with Canada—Trade Commission Notes—New Ruling on Coconut Oil—***

U. S.-Canadian trade pact, just concluded, from a number of different angles represents the most important step yet taken in placing into practical operation the Hull ideas on international trade relations. Most important aspect of the new rates from the chemical angle, which go into effect Jan. 1, '36, is the decline in the rate on acetic acid into this country, a change from a 2c to a 1¼c rate. Vinyl acetate and synthetic resins made from it will now carry a rate of 3c per lb. and 15% instead of 6c per lb. and 30%. Reductions have also been made on cobalt oxide, sperm oil, and acetylene black, while nickel ore and oxide, sulfuric, cyanamid, and sodium cyanide are bound on the free list.

U. S. gains a number of concessions in the way of lower rates for chemicals. The complete list and data on the new and old rates are obtainable from any Dept. of Commerce district office or from Washington. In Canada the pact is hailed in many quarters as a retreat from the Ottawa Agreement of a few years back. In both countries it is anticipated that the new rates will mean greater Canadian business for American chemical producers and a decline in tonnages of British chemicals entering the Dominion.

A substantial 2-way chemical trade exists between the U. S. and Canada. In '34, latest year for which detailed statistics are available, U. S. shipments to Canada by grand groups were as follows: Coal-tar products, $1,602,000; sodium compounds, $1,421,000; pigments, paints and varnishes, $1,787,000; fertilizers, $1,647,000; and sulfur, $2,650,000. Aggregate value of these exports, amounting to $9,107,000, represents a gain of approximately 33% as compared to the preceding year but a 40% decrease as against '29.

In addition to the chemical products mentioned above Canada obtains naval stores, gums and resins from the U. S. exceeding $1,000,000 in value per annum, as well as large quantities of medicinals, toilet requisites, pyroxylin products, printing inks, explosives, and a number of miscellaneous chemical products.

U. S. imports of chemicals from Canada consist largely of electrochemical products and included the following items in 1934: acetic acid, $1,846,000; sodium cyanide, $1,140,000; and fertilizer materials, $3,798,000.

### Casein Button Rules

Trade practice rules proposed for an industry designated as the *Vegetable Ivory Button Manufacturing Industry*, submitted to the Commission for its consideration and approval under its trade practice conference procedure, were made public last month.

### Agrees to Stipulation

Planters Edible Oil, both N. Y. City and Suffolk, Va., large-scale manufacturer of peanut oil, enters into a stipulation to cease and desist from unfair representations of its products.

### Interpreting Export Trade Act

The Commission has issued a new publication entitled Foreign Trade Series No. 2, outlining the practice and procedure under the Export Trade Act (Webb-Pomerene Act) which is administered by the F. T. C.

New report is a revision of Foreign Trade Series No. 1, published by the Commission in '19. It explains purpose of the Export Trade Act, provisions of Sections 1 to 5 thereof, and presents information as to the filing of export trade association papers with the Commission, also a discussion of the organization and operation of export associations. Pamphlet outlines advantages obtained by Webb-Pomerene law groups and lists products that have been exported by these associations and names of associations formed from 1918 to 1935.

### Philippine Coconut Oil

Imposition of a quota on coconut oil, in accordance with the law setting forth relations of the U. S. with the Philippine Islands pending the latter's complete independence, were revealed by the Treasury Dept.'s Customs Bureau last month.

All changes in duties and the quota on coconut oil become effective as of the date of signature of the Philippine independence bill, officials state.

In the case of coconut oil, 200,000 long tons per year may be entered duty free, but all in excess of this quota must pay the full duty. After the 5th year of Philippine independence, a duty approximating 5% of the duty on imports from other countries will be levied on all shipments to this country. Copra purchases from the islands are not affected.

# Foreign

***¶Brazil Seeks to Preserve Carnauba Wax and Oiticica Oil Monopolies—Maison De La Chimie's First Year — German Chemical Plant Wages—***

Brazil is taking active steps to preserve the Carnauba wax monopoly. Prizes will be awarded to the growers of the largest trees, and a recent decree prohibits seed exportation The President of Brazil has just authorized a prize of $4,000 to be awarded to the inventor of a machine for the extraction of Carnauba. U. S. imports during the 1st 3 quarters of the current year amounted to 8,784,000 lbs. ($2,225,000), compared with 7,000,000 lbs., valued at $1,319,000, for the corresponding period of '34.

Steps have been taken to encourage greater production of oiticica oil, which recently has come into prominence following the visit of Dr. Henry A. Gardner of the Institute of Paint & Varnish to Brazil last Spring in search of possible tung oil substitutes. Brazil Oiticica S. A., has been granted exemption for 12 years, but must complete a modern extraction plant in 18 months. Seed exportation is prohibited.

### International Chemistry House

President of the French Chemical Foundation (Maison De La Chimie), at a recent meeting of the directors of the institution, expressed himself as gratified with the work accomplished by the Foundation since its inception on Jan. 1, '35. Dedicated to the memory of Berthelot, eminent French scientist, the Foundation was established in Paris at the beginning of the current year with contributions and by concerted efforts of 63 nations.

### An Average Wage of $12

Almost total absence of labor troubles in American chemical plants, even during the depression and the abortive NRA period, would seem to indicate on the whole a general contentment on the part of the chemical worker with his lot. Not so favorable is the position of the German chemical worker, according to a dispatch from the American consul, stationed at Frankfort-am-Main, headquarters of the great I. G.

Reports Consul Redecker: "Despite a notable rise in the cost of living earnings of chemical workers have continued downward during the past several years due to wage cuts and shorter working weeks."

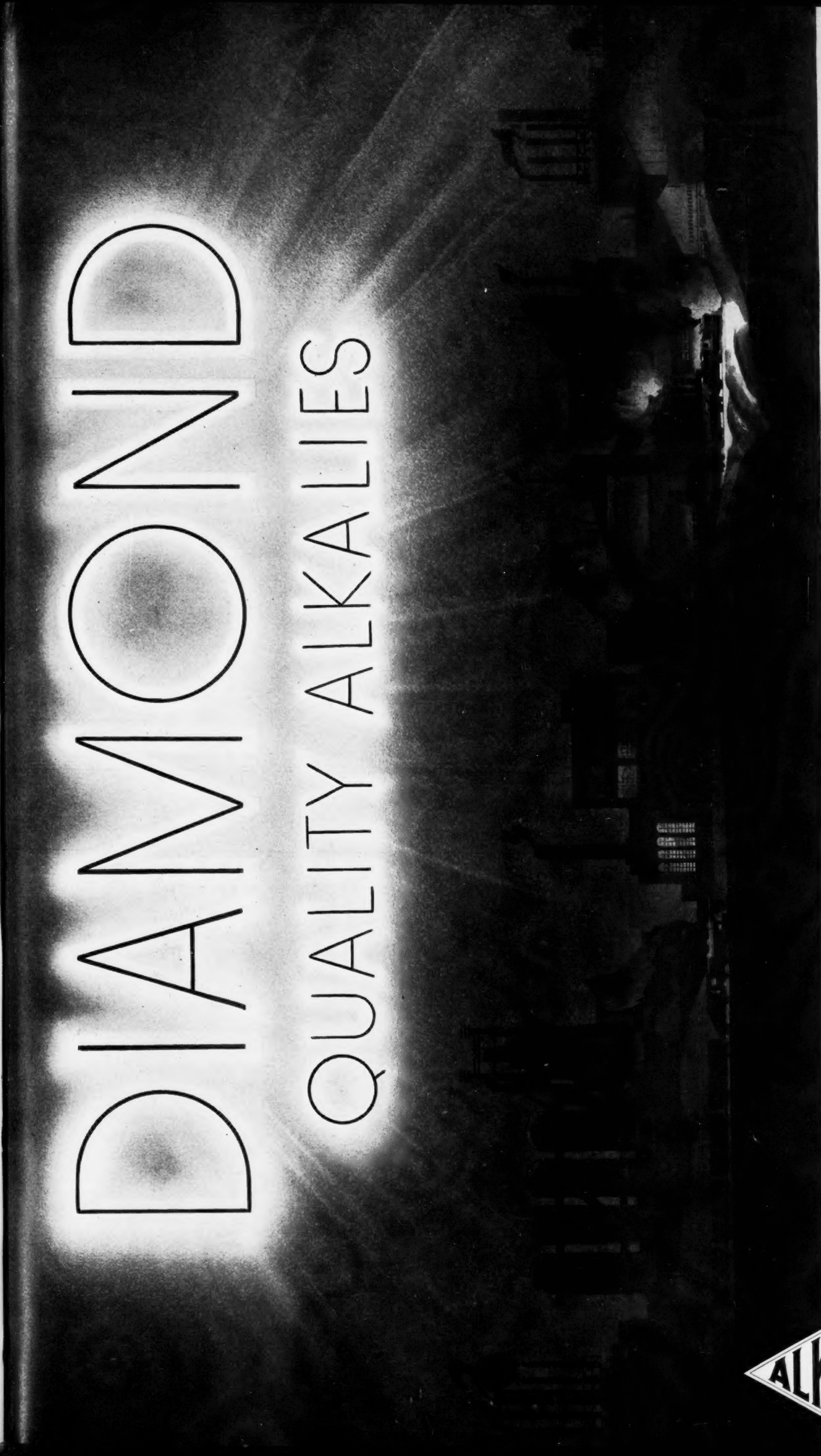
Average net wage for German chemical workers is about 30.22 marks, or about $12.00 per week.

### Lithopone Cartel Agreement

A new cartel agreement effective until the end of '39 has been reached between six German producers and the Czechoslovak Aussiger Verein, according to foreign reports.

### More Benzol, Demands Hitler

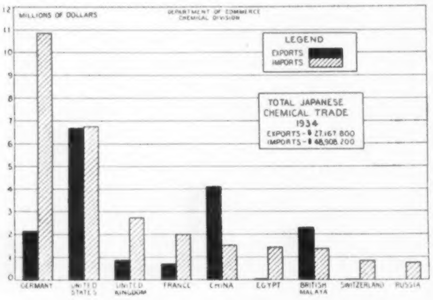
With the view to attaining partial independence of foreign sources for motor fuels, a decree has been issued in Germany requiring all large municipal gasworks to recover as much by-product benzol as possible from their operations. Although having only limited resources of petroleum, Germany is now supplying 40% of its motor fuel requirements from domestic sources.


DIAMOND
QUALITY ALKALIES

# Foreign Trade

### ¶*Japan Close to Chemical Self-Sufficiency — Now Exporting Large Quantities of Chemicals—New Custom Rulings Digested—*

Leading chemical producing and exporting nations have watched with keen interest the rapid expansion in recent years of both the Japanese and Soviet chemical industries, aided and abetted, of course, in each case by government aid, direct or otherwise. Both countries are




*Japan's foreign trade in chemicals in '34.*

rapidly graduating from the position of being an important customer to that of being a dangerous competitor in the battle for world markets, and in certain instances, the Japanese, particularly, have thrown scares into domestic producers in this country of certain items at various times.

How much progress Japan has made can be easily seen from the fact that from a place of being a large importer ($128,000,000 worth) in '29, she now is in the enviable position of producing not only most of her domestic needs but is exporting large quantities. Total for the 1st 7 months of '35, $16,180,000, is an 11% increase over the corresponding '34 period and 24% more than for the whole year of '32.

### Tariffs and Customs

Following receipt of an official report that no bounty is being paid by the Netherlands on the manufacture or export of yellow prussiate of soda, the Treasury Dept. has revoked an earlier order suspending liquidation of entries covering this material pending instructions as to assessment of countervailing duties.

U. S. Court of Customs & Patent Appeals, in upholding the customs court, rules that the shipment of egg-yolk imported by F. F. G. Harper & Co. is dutiable at 18c/lb. as dried egg-yolk instead of at 6c/lb. as egg-yolk, frozen or otherwise prepared or preserved.

U. S. Court of Customs & Patent Appeals upholds decision that imported crude glycerin must be marked to show the country of origin, in a case arising over importation from Cuba by Armour.

# Heavy Chemicals

### ¶*Bichromate Prices Advanced—November Shipments in Good Volume—Quiet Contract Season Expected — Nichols Requests Allied Management to Increase Number of Directors—*

Bichromate prices will be $\frac{3}{8}$c higher for '36. Contract quotations for bichromate of soda and bichromate of potash were announced Nov. 20 and the increase was not entirely unexpected by the trade. The '35 price level still reflected the unusually low price situation resulting from the price war of a few years ago.

As was briefly announced in the October issue tankcar and multiple tankcar chlorine quotations are $3 a ton higher. This advance was no surprise and an increase was freely predicted for several weeks. In sympathy with the higher chlorine price, bleaching powder makers raised quotations 10c per 100 lbs. Alkali prices for the coming year duplicate the present schedule. Most of the other important industrial chemicals will sell next year at present levels. Included in this group are: sodium fluoride, carbon tetrachloride, carbon bisulfide, sodium cyanide, caustic potash, potassium carbonate, the ammonias, white sal ammoniac, the inorganic acids, sodium bicarbonate, the metal cyanides, formic acid, manganese dioxide, and calcium chloride.

Sodium nitrite producers have altered their methods of quotations. The 25c freight allowance formerly made has been eliminated and the f.o.b. factory price lowered, but, actually, the new figure amounts to a 10c advance on carlots. Less-carlot quotations vary, depending upon location.

November tonnages, while not quite up to the October figures in most consuming industries, were highly satisfactory to industrial chemical producers, and the volume was well ahead of November of a year ago. Chemicals consumed in the automotive field and plating industries were in particularly heavy demand, indicating a much greater activity in the Detroit area. Tire centers also picked up appreciably in the 1st 3 weeks of November. The showing of '36 models 7 weeks in advance of the usual time has changed the automotive picture entirely. Whether such activity will discount some of the usual 2nd quarter business next year remains to be seen. Chemical producers are experiencing very little difficulty in lining up '36 contract business, and to date the season has been one of the quietest on record.

### Progress at Grande Ecaille

Reports indicate that Freeport Texas, is making decided progress in operating efficiency at Grande Ecaille deposit and an output of around 40,000 tons a month is said to be lowering costs considerably.

**Important Price Changes**

| ADVANCED | Nov. 20 | Oct. 31 |
|---|---|---|
| Bleaching powder | $2.00 | $1.90 |
| Chlorine | 2.15 | 2.00 |
| Fluospar, 85 and 5 | 16.00 | 15.50 |
| Potassium bichromate | .08½ | .08⅛ |
| Sodium bichromate | .06½ | .06⅛ |
| Sodium stannate | .34 | .33½ |
| Sodium silicofluoride | .05 | .04½ |
| **DECLINED** | | |
| Antimony metal | $0.14 | $0.15½ |

**DEPT. OF LABOR STATISTICS**

| | Sept.'35 | Aug.'35 | Sept.'34 |
|---|---|---|---|
| Employment *a* | 108.0 | 107.7 | 108.0 |
| Payrolls *a* | 98.8 | *z*100.8 | 92.1 |
| | **Aug.'35** | **July '35** | **Aug.'34** |
| Prices *b* | 84.3 | 84.6 | 79.2 |

**DATA FOR PROCESS INDUSTRIES**

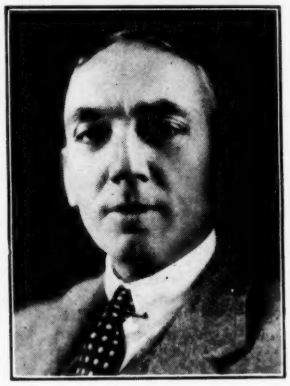
| | Sept.'35 | Aug.'35 | Sept.'34 |
|---|---|---|---|
| Explosives: | | | |
| Employment *a* | 86.2 | 86.5 | 93.2 |
| Payrolls *a* | 71.3 | 76.9 | 69.5 |
| Soap: | | | |
| Employment *a* | 103.1 | *z*98.0 | 93.6 |
| Payrolls *a* | 99.4 | *z*93.8 | 87.3 |

| | Oct. '35 | Sept. '35 |
|---|---|---|
| Exports | $2,207,000 | $1,860,000 |
| Imports | 1,634,000 | 1,292,000 |
| Crude sulfur, exports | 878,000 | 620,000 |
| Industrial Chemical Specialties, exports | 1,155,000 | 1,069,000 |

*a* 1923-25=100.0; *b* 1926=100.0; *z* Revised.

### Asks Wider Representation

C. W. Nichols, who waged a fight against the Allied management in '33, sent a letter to stockholders of that company



C. W. NICHOLS
*Condemns "reactionary management"*

last month suggesting that the "board of directors be strengthened by the inclusion of persons of standing in the community independent of, but cooperative, with the management." Mr. Nichols said it should not be necessary to disturb the company's affairs by a proxy fight.

Mr. Nichols, whose father was the founder of Allied, and who himself is one of the largest stockholders, said it was imperative to introduce into the directorate persons with a fresh point of view. He attacked the "reactionary" manage-

ment of the company and declared Allied was dropping behind its competitors in its established field and that the company had remained "relatively stagnant" while its competitors were going ahead.*

### Use of Aluminate Expands

Continental Chemical, Sands Springs, Okla., organized in '33 to manufacture sodium aluminate, reports continued expansion in the use of this chemical for treatment of raw water, in addition to its use in treatment of feed waters.

### Booklet on "Trona Ash"

Soda ash users will be interested in American Potash & Chemical's new booklet on Trona ash. Copies are available at the 70 Pine st., N. Y. City address or the Los Angeles office.

## New Construction

Glidden plans construction of new, smaller soy bean plant in Chicago. A mechanical process will be used, supplanting chemical process used in $1,000,000 plant, wrecked by explosion early in October. Officials plan $45,000 expenditure to include construction of plant and office building.

Construction of new fertilizer plant in Laurel, Miss., to be known as B. L. Moss Fertilizer Co., will be completed by 1st of the year. Plant will have 3,000 ton capacity.

Viscose plans to spend nearly $100,000 in plant improvement at Roanoke, including construction of new caustic soda reclaiming plant, estimated at $50,000.

Secretary of the Interior Ickes signs the 1st lease in U. S. history for operation of a carbon dioxide well to produce solid $CO_2$. Well is located in Carbon County, Utah, and is said to give almost pure gas. Farnham Dome Petroleum is the leasee and Carbon Dioxide & Chemical will operate the well.

I. F. Laucks, Inc., Seattle, Wash., adhesive and wall finish producer, begins construction of synthetic resin plant in Lockport, N. Y. A. H. Bowen, now in Seattle, will be plant manager.

Larrowe Milling, Toledo, Ohio, installs soy bean oil production unit in former Kasco Mills.

Marathon Chemical plans $100,000 expenditure for new plant at Rothschild, Wis.

"The first modern chemical sewage disposal plant in America—" is that of Dearborn, Mich., in the opinion of L. H. Enslow, editor of *Water Works and Sewerage*.

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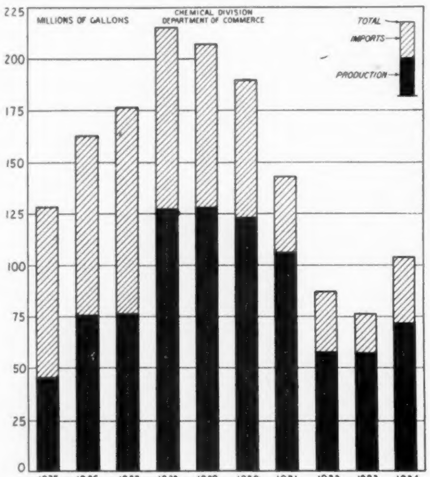
* Private comment by a number of chemical executives indicates sharp disagreement with Mr. Nichols' statement, several pointing to new Baton Rouge alkali plant and the recent development of a new chlorine-sodium nitrate process by Allied engineers.

## Coal Tar Chemicals

***¶Scarcity of Crude Naphthalene Sends Refined Prices Higher—Better Demand for Intermediates and Dyes — Coal Tar Solvents Again in Good Demand—***

Those watching the steady advance in the past few months in crude naphthalene (now at a $3.00 level) were prepared for the advance of 1¾c in refined. One reason mentioned in the trade for the scarcity of stocks of imported crude was




*Imports and U. S. Production of Coal Tar Creosote.*

that foreign producers were stocking crude oils for hydrogenation purposes, leaving the naphthalene in the oil. In the quotations for store delivery of refined material in N. Y. City, Philadelphia, and Chicago, an additional 30c per 100 lbs. is to be added for quantities under 2,000 lbs.

U. S. consumption of naphthalene is increasing rapidly as ever widening uses in industry are found and exploited. Production increased from 15,000,000 lbs. of refined and flake, and 8,400,000 lbs. of crude and refined in '24 to 38,750,000 and 37,900,000 lbs., respectively, in '34, and in spite of this increase in domestic production, imports over the same period advanced from 5,266,700 to 47,995,000 lbs. of crude naphthalene.

Domestic production figures for 1935 are not yet available but imports during the 1st 3 quarters of the year totalling 35,506,000 lbs. were almost identical with receipts for the 1st 9 months of last year.

**Imported Cresylic 4c Higher**

Imported cresylic is now 4c higher. Stocks abroad are said to be none too large, and consumption in the synthetic resin field has been increasing rapidly in the last few months. While domestic quotations remained unchanged up to

**Important Price Changes**

| ADVANCED | Nov. 20 | Oct. 31 |
|---|---|---|
| Acid cresylic, imp. | $0.49 | $0.45 |
| Naphthalene, crude | 3.00 | 2.50 |
| Naphthalene, rfd. prices advanced 1¾c. | | |

DECLINED
None.

Nov. 21, a firmer tone was reported in all directions.

Only few '36 contract prices are out. Phthalic anhydride and maleic '35 quotations are being renewed. Additional price releases are expected momentarily.

**Consumption in Textiles and Leather**

The higher rate of activity in the textile and tanning fields has at last been reflected in an improved demand for intermediates and dyes, and a decided strengthening in the price structure of the latter is reported.

**Automotive Production Rises Sharply**

November automobile production is expected to reach 250,000 units, and December estimates are for 300,000 cars as a minimum. With such activity in finishes and in the tire field the demand for solvents has spurted. Shortage of spot stocks of xylol, toluol and solvent naphtha remains unchanged. Benzol is firm, and a continued call for phenol shipments is reported.

## Fine Chemicals

***¶Further Rise in Mercury Prices Not Reflected in Mercurials — November Business Satisfactory***

The fine chemicals markets were generally quiet during the 1st 3 weeks of

**Important Price Changes**

| ADVANCED | Nov. 20 | Oct. 31 |
|---|---|---|
| Mercury metal | $75.00 | $74.00 |
| **DECLINED** | | |
| Geranyl acetate | $1.75 | $2.25 |
| Iron-ammonium citrate: | | |
| Brown scales | .50 | .52 |
| Gran. | .40 | .42 |
| Pearls | .40 | .42 |
| Green scales | .50 | .52 |
| Gran. | .40 | .42 |
| Pearls | .40 | .42 |
| Iron-ammonium oxalate | .24½ | .26½ |
| Iron-soda oxalate | .24½ | .26½ |

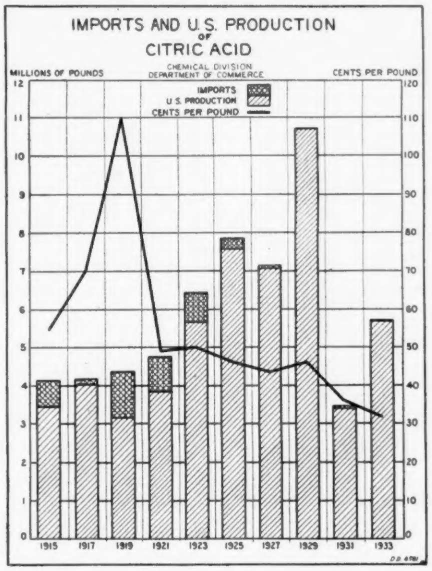
DEPT. OF LABOR STATISTICS

| | Aug.'35 | July '35 | Aug.'34 |
|---|---|---|---|
| Drugs and Pharmaceuticals prices *b* | 73.8 | 74.0 | 72.7 |
| | **Sept.'35** | **Aug.'35** | **Sept.'34** |
| Employment, Druggist's preparations *a* | 99.5 | *z*97.3 | 103.0 |
| Payrolls, Druggist's preparations *a* | 97.3 | *z*92.0 | 92.3 |

*a* 1923-25=100.0; *b* 1926=100-0; *z* Revised.

November with the price structure firm. Mercury continues to advance as stocks

dwindle, yet there has been no price re-adjustment on the mercurials because of the degree of competition existing on these items.




### Closer Watch on Credits

Several suppliers of raw chemical materials to drug and cosmetic manufacturers, and to other users of drugs and industrial chemicals and several container and label concerns selling in the Metropolitan area about 6 months ago formed a credit interchange bureau. Group is now seeking to enlarge its membership. Louis Candee, credit manager of L. Sonneborn Sons, Inc., is chairman of the Drug, Cosmetic and Chemical Credit Men's Association, and Mr. Nat Ottensosser of the Fifth Avenue Protective Association, is its secretary. Group meets at least once every month for the interchange of credit information and new ideas.

Among the companies with representatives are: Heyden Chemical, Charles Huisking, Philipp Bros., Innis, Speiden, L. Sonneborn, Whittaker, Clark and Daniels, Commercial Solvents, Alsop Engineering, Wishnick, Tumpeer, R. F. Revson, and several others.

### Chemical Employment Rises

Chemical factory employment for the month Aug. 15 to Sept. 15 advanced 2.5% to 108.0, a rise of 1.9% over corresponding '34 levels, according to Bureau of Labor Statistics figures. Payroll totals reached 98.8, a rise of 2.1% over the monthly period, and a 10.2% increase over corresponding '34 figures. Employment in chemical industries still tops general average for all industries by 32.4%. Payrolls totals are 37.4% over the general average for the month.

### French Chemical Business

Philip D. Level, International Selling's president, returning from France, reports a slight improvement in the chemical industry in that country.

## *Textile and Tanning Chemicals*

***¶Starch and Dextrin Prices Decline—Chemical Consumption at High Point—Record Shoe Production Likely—***

Despite a corn crop report indicating a decline of 13.7% below the 5-year average and 2,000,000 bu. below last year's total, corn prices have been weak over the past several weeks. As a result, starch and dextrin quotations are off 15c. Further fluctuations in the currency exchange was the cause of another advance in egg yolk. Increase in sodium and potassium bichromates is reported in the Heavy Chemical Section.

#### Cause for Optimism

Suppliers of chemicals to the textile and tanning fields experienced a very busy 3 weeks through Nov. 21. Whether the total chemical tonnages exceeded the 1st 3 weeks of October is difficult to ascertain, but certainly they were greatly ahead of November of last year. Despite a great deal of pessimism among shoe producers early this year, the total production for '35 is more than likely to top that for any year, even '29. Output for the current year will range around 367,000,000 pairs, a new all-time peak substantially exceeding the 1929 record of 361,402,000 pairs, according to estimates. Production in October was put at around 35,000,000 pairs, bringing the 10-month total to about 320,350,000 pairs, as against 310,068,000 pairs for the corresponding period of '34. Assuming that the total for the final 2 months of this year is 47,000,000 pairs, a figure equal to the '34 amount, the '35 production would be in the neighborhood of 367,350,000 pairs, in comparison to 357,119,000 pairs last year, the 2nd highest mark.

Moreover, the outlook for next year is particularly good. A poll of the manufacturers exhibiting at the 3-day style show of the Shoe Fashion Guild of America at the Waldorf in N. Y. City last month indicated the strong possibility that the business placed in the next month would be the largest since '29.

#### Textiles—A Bright Picture

The textile industry continues to hold fairly close to the high rate of activity that has featured the field for the past few months. There was, however, some let-up in woolen goods sales, but reports from the mill districts reveal the fact that most manufacturers have just about booked as much business as they can comfortably handle between now and Feb. 15. Orders now on hand aggregate about 35,000,000 linear yards. For the 1st 9 months of '35 consumption of apparel wool was 82% ahead of the similar period in '34 and 13% ahead of the consumption in a normal year.

Cotton consumed during October was reported by the Census Bureau to have totaled 552,187 bales of lint and 67,106 of linters, compared with 449,126 and 61,127 during September this year and 523,032 and 56,612 during October last year. Cotton spinning industry was reported by the Bureau to have operated during October at 103.8% of capacity, on a single shift basis, compared with 93.9 in September this year and 97.1 in October last year.

Silk and rayon mills showed no signs of abatement in activity in the 1st 3 weeks of November. There is now strong likelihood that there will not be any appreciable let-up until close to the end of the year and the inventory period. Silk deliveries to American mills amounted to 47,937 bales in October, this being the highest figure since October '34.

**Important Price Changes**

| ADVANCED | Nov. 20 | Oct. 31 |
|---|---|---|
| Egg yolk, imp. | $0.56 | $0.55 |
| Tin tetrachloride | .26½ | .26 |
| Wattle bark | 30.00 | 29.00 |
| Valonia cups | 34.00 | 33.00 |
| **DECLINED** | | |
| Albumen, egg, imp. | $0.84 | $0.85 |
| Dextrine, Canary | 3.95 | 4.10 |
| British Gum | 4.15 | 4.30 |
| Starch, corn, pearl | 3.43 | 3.58 |
| Powd. | 3.53 | 3.68 |

### Chemical Specialty Co. Notes

Warwick Chemical, West Warwick, R. I., producer of chemical textile specialties, cites increasing business as reason for dividing its southern territory. New office in Concord, N. C., is in the charge of Earl Walker, formerly with Solvay. W. D. H. Searcy, 3rd, maintains original offices in Griffin, Ga.

Ciba plans to establish sales agency in Charlotte, N. C. C. E. Hayes, Ciba's Greenville manager, wants location suitable for laboratory and warehouse, as well as sales office space.

## *Chemical Specialties*

***¶Disinfectant Makers will Repeat Now Famous McCormick Convention Plan of 2 5-Hour Sessions — Trade-Mark Legislation in N. Y. — Notes on Specialty Makers—***

Program for the 22nd annual meeting of the National Association of Insecticide & Disinfectant Manufacturers, which will be held at the Waldorf-Astoria, N. Y. City, on Dec. 9 and 10, has just been issued in practically completed form by the secretary, John H. Wright. Copies are available in advance.

### N. Y. Trade-Mark Legislation

Joint legislative committee of the N. Y. State Legislature for revision of state trade-marks law holds final meeting. It is believed that opinions still differ within the committee on advisability of taking action on trade-mark legislation at this time. Advocates of suggested legislation point out that several other States await action by the State of New York.

### Cleaning Handbook

Magnus Chemical, Garwood, N. J., issues "The Metal Cleaning Handbook," 216 pages and containing 370 illustrations. Booklet includes sections on equipment, cleaning materials, metals, cleaning operations, coolants and cutting lubricants, etc. Written by Robert W. Mitchell, Magnus technical director, a limited number of copies is available to those interested in or concerned with metal cleaning. Others may secure the handbook at $1.00 a copy.

### Midway Adds Another Product

A furniture polish, added to the line of Midway Chemical, Chicago, is now advertised under the name of Aero Polish.


Courtesy—Printers Ink Monthly

*Pacific Coast Borax does an outstanding packaging "job."*

### Chemical Specialty Co. Notes

Socony-Vacuum leases 3-story building on Potter st., Cambridge, Mass., to Boston Blacking & Chemical.

American Disinfecting, Sedalia, Mo., dry cleaning solvents producer, adds new all-steel building containing 5,000 sq. ft. floor space. Recent addition to technical staff is Frank Gollub, new first assistant chemist.

### Lower Liability Rates

Efforts of the National Association of Exterminators and Fumigators to obtain lower public liability insurance rates have been successful.

## Solvents

**¶*Automotive and Tire Makers Expand Production Schedules—Question of Patented Denaturants Brought Out Into the Open—Butyl Alcohol Price Extended***

A definite expansion in the consumption of solvents occurred in November, occasioned largely, of course, by the increase in production in the Detroit automotive area and in the Akron tire center. Better demand was also reported by the dry-cleaning industry.

November production of cars in estimated to have reached 250,000 units and December production schedules call for approximately 300,000 units. Most of the forecasts now being made for '36 automotive production run around 4,500,000 to 5,000,000.

A firmer price trend in gasoline quotations in the East had the effect of strengthening solvent prices. In the Mid-West, however, the wide divergence of quotations on the part of various refiners still prevails. Producers of butyl acetate and butyl alcohol are taking contracts for 1st quarter deliveries at the lower price levels recently established. Ethyl acetate renewals are also being made, and on the basis of 7½c for tanks.

**No Cause for Alarm**

The alcohol industry and many users of special formulas are greatly disturbed over the use of tertiary butyl alcohol as a denaturant for formulas used by the perfumery and cosmetic industries. Protests have been made that because of certain patents there is but one manufacturer of the butyl compound.

Assurance has been given that the bureau will assist users of alcohol denatured with the butyl compound to prove use of this substance as a denaturant prior to the filing of the patent covering such use. This assurance is contained in a letter, dated Oct. 24, addressed to Martin H. Ittner, chairman of the committee on industrial alcohol of the A. C. S., by Stewart Berkshire, Deputy Commissioner of Internal Revenue. This letter came in response to a protest filed by Mr. Ittner, Oct. 18.*

### How Many Solvent Systems?

A representative of one of the big chemical companies recently asked a representative of the *National Cleaner & Dyer* how many synthetic solvent systems were in operation in this country. Offhand and as a flash answer the reply was 2500. Then they sat down together and listed them by makes, checking and double-checking until they were sure they were conservative. Then they added up the column and got 2467. That's minimum.

* Treasury Dept. also reports that Eastman Kodak (holder of patent on sucrose octa-acetate, denaturant in 23-G) has agreed to issue a license for its use.

**Important Price Changes**

**ADVANCED**

| | Nov. 20 | Oct. 31 |
|---|---|---|
| None. | | |

**DECLINED**

None.

**DEPT. OF LABOR STATISTICS**

Petroleum Refining:

| | Sept.'35 | Aug.'35 | Sept.'34 |
|---|---|---|---|
| Employment a | 110.1 | z112.2 | 112.9 |
| Payrolls a | 103.1 | z102.5 | 96.3 |

| | Oct. '35 | Sept. '35 |
|---|---|---|
| Petroleum & Products: | | |
| Exports | $19,648,000 | $23,119,000 |
| Imports | 3,164,000 | 4,006,000 |

a 1923-25=100.0; z Revised.

## Oils and Fats

**¶*Chinawood Prices Ease Still Further—Fish Oils Higher, But Animal Fats Decline—***

A still easier tone was noted in the market for Chinawood in the 1st 3 weeks of November. Business was said to have passed at 17c in tanks, which appears to be an extremely low figure after some of the quotations reported in the last 60-90 day period. Further, there were offerings, according to rumors in the trade, of March and later positions at 13c. At one time last month it was reported that the importers had withdrawn all quotations on Chinawood, but this was denied by one of the largest factors within 24 hours.

Oiticia oil prices declined sharply too, as the price of Chinawood declined. A quiet but steady market was noted for most of the other vegetable oils, particularly linseed, coconut and corn. Most of the fish oils were higher in the November period, while the animal oils, generally, were off slightly. Trading in refined cottonseed oil futures was within a narrow range during the 1st 3 weeks of November.

October cottonoil consumption fooled speculators and consumers when 398,382 bbls. were reported, largest month since September, '34, and 3rd largest on record.

Virtues of linseed oil and meal will shortly be extolled through a recently launched national advertising and educational campaign, plans for which were formulated at a meeting in Milwaukee Nov. 6, and attended by 7 of the leading producers. Executive officers of the Linseed Meal Educational Committee will be located in the Commerce Bldg., Milwaukee. Klau-Van Pieterson-Dunlap Associates, will handle the publicity.

# *Paints, Lacquers and Varnish*

**Important Price Changes**

**ADVANCED**

| | Nov. 20 | Oct. 31 |
|---|---|---|
| Casein, 20-30 | \$0.14½ | \$0.13 |
| 80-100 | .15 | .13½ |
| Red vermillion | 1.58 | 1.55 |

**DECLINED**

None.

**DEPT. OF LABOR STATISTICS**

| | Sept.'35 | Aug.'35 | Sept.'34 |
|---|---|---|---|
| Employment *a* | 106.7 | *z*105.5 | 98.8 |
| Payrolls *a* | 89.5 | *z*87.8 | 75.8 |

| | Aug.'35 | July '35 | Aug.'34 |
|---|---|---|---|
| Prices *b* | 78.6 | 79.1 | 79.9 |

| | Oct. '35 | Sept. '35 |
|---|---|---|
| Pigments, Paints and Varnish, exports | \$1,241,000 | \$1,352,000 |

*a* 1923-25=100.0; *b* 1926=100.0; *z* Revised.

***¶Casein Prices are Rising Rapidly — Carbon Black Figure Repeated — No Dry Color Prices Out — Paint Sales in Heavy Volume—***

Casein quotations again advanced last month, continuing the upward trend in this commodity which has been one of the outstanding features of the raw paint materials market for some time. Indications seem to point to still further advances during the winter period. The higher price level is now allowing increasingly large quantities of Argentine casein to enter into domestic consumption.

**Are We Self-Sufficient?**

The U. S. is rapidly attaining self-sufficiency in casein. In '20 two-thirds of the casein required in American industry was obtained from foreign countries, and as late as '29 approximately one-half was imported. By '34, however, only 4% of the casein required was imported, balance being supplied by domestic producers.

Domestic production of casein during '34 reached the high total of 37,331,000 lbs., according to statistics gathered by the Bureau of Agricultural Economics, Dept. of Agriculture. This compares with 24,000,000 in '33, 21,000,000 in '24, and around 7,000,000 in '22.

Casein imports amounted to only 1,500,000 lbs. during '34 compared with 27,580,000 in '29 and an average of about 22,500,000 per annum during the 7 years following '22. Imports since the beginning of '35, have increased slightly totalling 1,250,000 during the 1st 8 months of the year compared with a little over 1,000,000 lbs. for the corresponding period of the preceding year.

**Pigment Prices Unchanged**

Pigment manufacturers are renewing contracts on most items in this classification at unchanged levels. Carbon black prices are repeated for '36. Statistically both zinc and lead improved in October. Despite the decline in lead and zinc stocks and increased use of both, there have been no changes in quotations for pig lead or zinc for several weeks and the trade is beginning to wonder what reasons are in back of such action. The trade was mildly surprised that zinc oxide producers were willing to take business for the 1st 6 months of '36 at the low prices now prevailing. In many quarters the opinion had been freely expressed earlier in the fall, when the drastic price reductions were placed in effect, that such action would prove to be only temporary. Lithopone and titanium pigments makers are soliciting business on the 6 months basis also and carbon black contracts contain a clause permitting price adjustments on July 1. No prices on dry colors were released up to Nov. 21, and none were really expected prior to Dec. 1. The rise in bichromate prices for '36 is expected to strengthen the chrome green and chrome yellow quotations for next year, but whether such action means a definite price increase remains unanswered at the moment by chrome color manufacturers.

**Gums—Naval Stores—Shellac**

A few price adjustments were made in several of the varnish gums. Rosin and turpentine prices lost ground in the 1st 3 weeks of November when comparisons are made with the closing quotations on Oct. 31. A new falling off in demand was reported from the primary centers. Naval stores industry is awaiting the outcome of the several meetings being held to consider a proposed new marketing agreement. Shellac and wax prices were steady and unchanged during the period under review.*

**Paint Sales Better than Seasonal**

Paint sales continue in heavy volume, contrary to the general seasonal trend. Continuance of fairly mild weather, permitting outdoor work, plus the fact that a large number of PWA and modernization projects are now reaching the painting stage are some of the reasons advanced for the large increase over normal in fall paint sales.

Indicative of decided betterment in paint sales in the past few months is the statement of President Joyce of Glidden that October sales were the best for any month this year, a gain of 14.5% over September and 42.3% over October of last year. Paint division which normally falls at this period was aided by increased auto production and mild weather permitting the extention of the period for outside work.

**Construction Gains Momentum**

Partly because of private activity, partly because of the momentum of the WPA, construction has gained sharply, according to F. W. Dodge Corp. For October, volume undertaken in 37 eastern states totaled \$200,863,700. This was the highest monthly volume reported since that shown for December, '33, which, incidentally, was the month of peak undertakings of the original PWA.

Excluding December, '33, it is necessary to go back to the records of the Autumn of '31 to find construction totals larger than the one turned in during October. Last month's record compares with \$167,376,200 for September and was almost 50% greater than the total of \$135,224,800 reported during October, '34.

## Church, New Supply Dealer

J. W. Church & Co. is the designation of a new Cleveland paint raw material dealer with offices at 17325 Euclid ave. Through his former connection, president of Pure Calcium Products, Dealer Church is well-known to the paint trade.

## Another Edition of the "Bible"

The "Paint Bible"—famous voluminous treatise, officially designated Physical & Chemical Examination of Paints, Varnishes, Lacquers, Colors, etc., and edited by Dr. Henry A. Gardner goes into the 7th edition. Copies at \$11 may be had through the N. P. V. & L. A. offices in Washington.

## Matteson is Cabot Representative

M. R. Matteson, paint manufacturers' representative, Detroit, takes on agency for Godfrey L. Cabot, Inc.

## Louisville P. V. & L. A. Elects

Louisville Paint, Varnish & Lacquer Association elects following officers for coming year: P. T. Eitel, Porter Paint, president; H. A. Fitzpatrick, Peaslee Gaulbert Paint & Varnish, vice-president; W. R. Fritsch, Kentucky Color & Chemical, secretary-treasurer. Executive committee members are: Bodley Booker, chairman; S. E. Booker, Peaslee Gaulbert; E. Hancock, Louisville Varnish; C. Lussky, Progress Paint; and J. F. Kurfees and Kenneth E. Clark, of Chas. Long, Jr., Paint.

# *Moves*

Link-Belt, formerly located at 910 S. Michigan ave., Chicago, moves to 307 N. Michigan ave., occupying entire 23rd floor in the Bell Bldg.

Paul O. Abbé, Inc., (ball & pebble mills, etc.), opens Chicago office at 407 S. Dearborn st.

* Success in drafting new naval stores agreement seemed further away than ever when the control committee resigned on Nov. 16. Others held, however, that this was simply a move to "clear the deck" for a new agreement. Fear of further deterioration of rosin stocks in government hands may cause sale of part soon.

# Fertilizers

| Important Price Changes | | |
|---|---|---|
| **ADVANCED** | | |
| | Nov. 20 | Oct. 31 |
| Bone meal, imp. | $24.00 | $23.00 |
| **DECLINED** | | |
| Blood, dried, N. Y. | $3.00 | $3.25 |
| Chgo. | 2.95 | 3.50 |
| Imp. | 3.07½ | 3.25 |
| Bone meal, Chgo., 3 & 50 | 17.00 | 19.00 |
| Calcium phosphate, precip., unit | .59 | .62 |
| Castor pomace, imp. | 17.50 | 18.00 |
| Tankage, grd., N. Y. | 2.90 | 3.00 |

| DEPT. OF LABOR STATISTICS | Aug.'35 | July '35 | Aug.'34 |
|---|---|---|---|
| Fert. Mat. prices *b* | 66.8 | 65.7 | 64.8 |
| Mixed Fert. prices *b* | 68.1 | 68.6 | 73.0 |

| | Oct. '35 | Sept. '35 |
|---|---|---|
| Fertilizers & Materials: | | |
| Exports | $1,851,000 | $1,852,000 |
| Imports | 1,456,000 | 1,051,000 |

*b* 1926=100.0.

## ¶*Industry Shocked at Melvin Death—400 Attend Atlanta Convention—Raw Materials Market Sluggish—Varying Opinions on Season's Outlook—*

Fertilizer producers, meeting at Atlanta, Nov. 19 and 20, were urged to cooperate in the elimination of unfair trade practices undesirable both to consumers and to manufacturers of fertilizer. Nearly 400 fertilizer men heard W. T. Wright, Norfolk, Va., N. F. A. vice-president, make a plea for industry cooperation in the opening address of the Association's fall meeting. Mr. Wright substituted on the program for C. T. Melvin, president, whose death occurred only a few hours before the convention started deliberations.*

Speaking on "Industry Self-Government," Mr. Wright told of the opportunity which the industry has, in the light of past experiences, for governing itself fairly and advantageously under existing law.

Very little actual business in raw fertilizer materials was placed in the 1st 3 weeks of November. Interest centered in the Atlanta convention with buyers unwilling to contract ahead on futures until some of the policies to be followed in the coming season are more generally known.

Organic ammoniates were weak again last month, but while some tonnage changed hands, total was exceedingly small. Other price changes were relatively unimportant. Until announcement is made of nitrate prices past Dec. 31 there is very little likelihood of any heavy trading in the nitrogen products.

### Dept. of Agriculture's Viewpoint

Fertilizer mixers are severely critical of a recent Dept. of Agriculture forecast of lower fertilizer prices for the coming spring season. Say the mixers—"Such forecasts are somewhat inappropriate to say the least," and point out that increased cost of many raw materials and a splendid record of wage rate maintenance make such a possibility unlikely.

What do the farmers say? Very little at the moment. What do they secretly hope for?—a return to the cut-throat, "knock-em-down and drag-em-out" competition that had one of America's foremost industries groggy on the ropes.

If a return to former chaotic conditions result next spring it will not be the result of lack of forethought on the part of the industry's leaders. This was very self-evident in the determined countenances of the fertilizer executives gathered together in Atlanta last month. The industry was one of the very few to indicate any appreciable desire for a continuance of NRA in the poll taken by C. I. in February. It was the 4th to come forward with a proposed voluntary agreement, when on Nov. 8, 90% of the capacity of the industry requested approval of labor provisions under the amended NIRA.

### Opinion of John J. Watson

A more optimistic note is expressed by one of the leading executives in the industry, President John J. Watson of I.A.C., and a former N.F.A. president.

"The fertilizer industry, which is almost entirely governed by the success of farmers throughout the country, should enjoy a very satisfactory season," Mr. Watson pointed out. "Farmers in Maine have been securing as high as $1.80 a bag for potatoes this year," he added, "whereas in 1934 they were only getting approximately 45c.

"The cotton situation does not appear to be any different than it was last year, but pork is considerably higher and, since corn is largely used in the feeding of hogs, the fertilizer trade should benefit by any tendency toward increasing the output of grain for feeding purposes."

### Now Domestic Crystal Urea

The layman is not likely to know that one of the many diversified du Pont interests is that of supplying fertilizer raw materials. Yet from its Belle, W. Va., plant comes a steady stream of nitrogen products. Du Pont chemists are elated at their latest achievement, crystal urea.

Urea was 1st discovered in 1773. It was synthesized by the German chemist Wohler in 1828 from ammonium cyanate. Wohler's experiment was considered of great importance because it was the 1st time that a substance known to be manufactured in life processes was ever prepared by man from a substance known to have no connection with living things. Previously it was thought that substances found in living tissues were unique and obeyed laws different from those of the chemical compounds with which chemists were acquainted.

Urea from German sources has been on the American fertilizer market for several years, but the du Pont product is the 1st to be produced commercially by the American chemical industry.

### October Tag Sales a Record

October fertilizer tag sales in Southern states reached 151,270 tons, largest volume on record for the month, 20% ahead of October a year ago, and the 1st month since June to exceed the corresponding period of '34. In the last 4 years October sales have averaged 3.1% of the year's total.

Totaling 3,750,612 tons, sales in the 1st 10 months were 11% larger than in '34, but were 34% under volume in January-October, '30, peak year for sales. Only states in which sales this year have run under last year's are Florida and Arkansas, and the declines have been relatively small.

October sales in 5 mid-west states totaled 25,512 tons, new high for the month and more than 6 times as high as in October of last year. It was the 6th consecutive month in which sales were larger than in the corresponding month of last year. In the last 4 years October sales in the mid-West averaged 3.3% of the year's total.

### Better Business in Rock

Whenever phosphate rock or superphosphate statistics are quoted either one of 2 accepted authorities is usually mentioned; A. N. Gray, secretary of the International Superphosphate Manufacturers' Association, or the Florida Pebble Phosphate Export Association, whose efficient secretary is F. C. Noyes.

Expert Statistician Gray, from his London office, announces that '34 superphosphate world production increased 7% over '33, or 14,065,452 tons to 13,148,532. In the same periods rock production increased 10%.

Domestic rock producers are elated at the September Tampa export total, 99,968 tons, a new high for at least 7 years and possibly an all-time record. October preliminary figures lead to the belief that October will prove even better than September.

### Our Exports Increase

Devaluation of the dollar, plus other factors, have tended to raise the volume of our fertilizer exports in the past 18 months. September, with a tonnage of 208,797 ($1,351,730), had the greatest volume for any month for at least 6 years. Compared with September of '34 the gain is 90% in volume and 46% in value.

* In a special election A. D. Strobhar, president, Southern Fertilizer & Chemical was elected president for the unexpired term.

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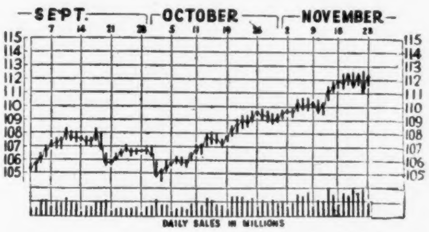
# Chemical Finances

***¶Stock Market Booms as Speculative Fever Grips Country—Less Interest in the Chemical Stocks—Davison Chemical Reorganization Plan Approved—Bitter Battle Over Control of V.-C. Continues—Du Pont Declares Special Dividend of G. M. Stock—***

The steady gain in the stock market is one of the chief topics of conversation, and already there is talk of "The Bull Market of '35." Some of the gain in the 1st half of November came as a result of the reported informal orders of the President for definite budget reductions and the flood of statements from one set of government officials that business need fear no further meddling, but it is safe to say that much of the advance is due directly to the beginnings of a speculative fever. One of the surest indications that this is so is the volume of trading. Where 6 months ago a 3,000,000 share day would have provided a distinct shock to the Street, the financial district is now thoroughly accustomed to such activity.




—N. Y. Herald-Tribune

*Is the steady rise over the past 6 months an indication of a new "Bull Market"?*

#### Chemical Stocks Lag Behind

Chemical stocks did not generally rise in direct proportion with the rest of the market. In many quarters the feeling prevails that the chemical stocks are selling at too high prices based on current dividend yield, and as a natural result, some interest has drifted away from the chemical stocks and is now centered in other groups. Between the close on Oct. 25th and the close of Nov. 15th Allied lost 6 points. In the same period Air Reduction gained 6¼ points, Columbian Carbon 1 point, du Pont 7 points, Monsanto ⅝ths, and U. S. I. made a net gain of but ½ point.

### Fertilizer Companies Make News

Both V.-C. and Davison Chemical were featured in last month's news, the muddled state of the former being further aggravated by the resignation of 6 officials in protest against the ousting of A. Lynn Ivey as president. That the ousted faction will resort to court action is the generally accepted belief in fertilizer circles.

Reorganization plan for Davison Chemical and associated companies has been confirmed. The Davison Chemical Corp. has been incorporated in Maryland, and Chester F. Hockley is slated for the presidency.

#### Dart Seeks to Restore Ivey

V.-C. officers have been notified that sufficient stockholders had signed the call for a special meeting on Dec. 17. Joseph A. Dart largest individual prior preference stockholder and former director, is calling the meeting. One purpose is to overcome the control of George S. Kemp and associates and the reinstatement of A. L. Ivey as president.

Gustavas Ober, Jr., of Baltimore, has been elected vice president, succeeding M. S. Purbis, resigned. Mr. Ober is a former president of the National Fertilizer Association and was connected with the fertilizer firm of G. Ober & Sons.

### Du Pont Declares Special

For several days last month rumors spread through the financial centers that the du Pont Co. would do something special for its stockholders. On Nov. 18 directors declared a special dividend of one-fifty-fifth of a share of General Motors common to each share of du Pont common, payable on Dec. 27 to holders of record of Nov. 27.

Distribution will be made from 200,000 shares of G. M. common, acquired by du Pont in small lots as a current, temporary investment over the last 5 years. It is entirely divorced from the permanent investment of 10,000,000 shares of G. M.

Directors also declared the regular dividend of 90c a share on the $20 par value common, also payable on Dec. 14 to holders of record of Nov. 27, and the regular quarterly dividend of $1.50 on the debenture stock, payable on Jan. 25 to holders of record of Jan. 10.

**Dividends and Dates**

| *Name* | *Div.* | *Stock Record* | *Payable* |
|---|---|---|---|
| Abbott Laboratories (stock) ..... | 33-1/3% | Nov. 1 | Nov. 15 |
| Archer-Daniels-Midland ....... | 25c | Nov. 21 | Dec. 2 |
| Archer-Daniels-Midland, Sp. .. | 25c | Nov. 21 | Dec. 2 |
| Atlas Powder .... | 50c | Nov. 20 | Dec. 10 |
| Columbian Carbon. | $1.00 | Nov. 14 | Dec. 2 |
| Columbian Carbon, Sp. ........... | 40c | Nov. 14 | Dec. 2 |
| Comm. Solvents .. | 30c | Dec. 2 | Dec. 31 |
| Eastman Kodak, ex. | 25c | Dec. 5 | Jan. 2 |
| Eastman Kodak ... | $1.25 | Dec. 5 | Jan. 2 |
| Eastman Kodak, pf. | $1.50 | Dec. 5 | Jan. 2 |
| Freeport Texas ... | 25c | Nov. 15 | Dec. 2 |
| Freeport Texas, pf. | $1.50 | Jan. 15 | Feb. 3 |
| Lindsay Lt.&Chem. | 10c | Nov. 9 | Nov. 18 |
| Merck .......... | 10c | Dec. 23 | Jan. 1 |
| Merck, pf. ....... | $2.00 | Dec. 23 | Jan. 1 |
| Monsanto ....... | 25c | Nov. 25 | Dec. 14 |
| Monsanto, ex. ... | 25c | Nov. 25 | Dec. 14 |
| Nat'l Lead, pf. A . | $1.75 | Nov. 29 | Dec. 14 |
| Penick & Ford.... | 75c | Dec. 2 | Dec. 16 |
| Sher.-Williams, pf. | $1.50 | Nov. 15 | Dec. 2 |
| Spencer Kellogg & Sons .......... | 40c | Dec. 15 | Dec. 30 |
| Westvaco ........ | 10c | Nov. 15 | Dec. 2 |

### Approve Nitrate Financing

Holders of Anglo-Chilean Nitrate 7% first mortgage debentures approve amendments to the trust deed to provide for extension of maturity of the bonds from Jan. 1, 1950, to 1961, reduction in annual interest rate to 4½%, reduction in annual sinking fund to ½% plus ½ of remaining earnings in excess of interest and sinking fund.

### Hercules' Stockholders to Vote

Hercules' stockholders will vote Dec. 16 on a proposal to change preferred from a dividend rate of 7% to 6%, and to make the stock non-callable prior to Nov. 15, '41.

### Earning Statements

Net income of Cyanamid and subsidiaries in the 1st 9 months was reported as $2,533,969 after depreciation, depletion, research and process development expenses, interest, Federal taxes, minority interest and other charges. Earnings were equivalent to $1 a share on 2,520,370 shares of $10-par combined Class A and B common stocks outstanding at the end of the period, excluding shares held by subsidiaries.

In the corresponding period of last year net profit was $1,573,988, or 62c a share on the combined A and B shares.

Consolidated income account for 9 months ended on Sept. 30 compares with that of a year before as follows:

| | 1935 | 1934 |
|---|---|---|
| Oper. profit after exp. .. | $5,186,565 | $4,082,930 |
| Other income .......... | 549,337 | 452,469 |
| Total income ....... | $5,735,902 | $4,535,399 |
| Depreciation and depl. .. | 1,553,139 | 1,369,397 |
| Research and process devl. exp. ................ | 870,345 | 891,632 |
| Interest ...... ........ | 331,278 | 292,297 |
| Prov. for income tax ... | 363,650 | 328,993 |
| Minority interest ....... | 83,521 | 79,092 |
| Net income ........ | $2,533,969 | $1,573,988 |

United Chemicals, Inc., and subsidiaries report for 9 months ended Sept. 30, '35, net loss of $38,151 after taxes, depreciation, etc., comparing with net loss of $66,784 in 1st 9 months of '34. For quarter ended Sept. 30, indicated net loss, based on a comparison of company's reports for the 6 and 9 months periods, was $11,024 after taxes and charges against net loss of $13,005 in preceding quarter and net loss of $18,847 in September quarter of previous year.

American Agricultural Chemical Co. reports for the period from July 1 to Oct. 3 a net loss of $109,600, against a net loss for the period from July 1 to Sept. 27, '34, of $102,450. Gross profit from operations was $275,744, against $258,525 last year. Among the charges were reserves for self insurance of $174,514, against $148,055 in '34.

# Chemical Stocks and Bonds

## Stocks

### NEW YORK STOCK EXCHANGE

| 1935 November xLast | 1935 November High | 1935 November Low | 1934 High | 1934 Low | 1933 High | 1933 Low | Sales, Number of shares x Nov. 1935 | Sales, Number of shares 1935 | Stocks | Par $ | Shares Listed | An. Rate* | Earnings $-per share-$ 1934 | Earnings $-per share-$ 1933 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 170½ | 173 | 104⅜ | 113 | 91¾ | 112 | 47½ | 8,500 | 127,300 | Air Reduction | No | 841,288 | $5.50 | 4.98 | 3.79 |
| 164⅞ | 173 | 125 | 160¾ | 115⅛ | 152 | 70¾ | 21,600 | 216,110 | Allied Chem. & Dye | No | 2,214,099 | 6.00 | 6.83 | 5.50 |
| 126½ | 129 | 122½ | 130 | 122⅛ | 125 | 115 | 1,200 | 21,400 | 7% cum. pf. | 100 | 345,540 | 7.00 | 50.79 | 42.24 |
| 51½ | 57¾ | 41½ | 48 | 25¼ | 35 | 7¼ | 5,700 | 130,500 | Amer. Agric. Chem. | 100 | 315,701 | 2.00 | 6.37 | p4.19 |
| 31⅝ | 35¾ | 22½ | 62½ | 20¾ | 89⅞ | 13 | 81,500 | 376,700 | Amer. Com. Alcohol | 20 | 260,716 | None | 3.57 | 4.56 |
| 46½ | 52 | 36 | 39⅛ | 26¼ | 29¼ | 9¾ | 7,700 | 114,300 | Archer-Dan-Midland | No | 541,546 | 1.50 | p4.21 | p3.82 |
| 46⅜ | 48½ | 32¾ | 55½ | 35¼ | 39⅛ | 9 | 7,800 | 98,600 | Atlas Powder Co. | No | 234,235 | 2.00 | 2.49 | .74 |
| 112½ | 115 | 106¾ | 106¾ | 83 | 83⅛ | 60 | 410 | 5,820 | 6% cum. pfd. | 100 | 88,781 | 6.00 | 13.54 | 8.38 |
| 29⅛ | 35⅜ | 19½ | 44⅞ | 17⅛ | 58⅞ | 4½ | 77,600 | 1,085,600 | Celanese Corp. Amer. | No | 987,800 | None | 1.25 | 3.32 |
| 18 | 19¼ | 15⅛ | 18⅛ | 9½ | 22⅜ | 7 | 39,800 | 677,600 | Colgate-Palm.-Peet | No | 1,985,812 | .75 | 1.16 | — .57 |
| 105½ | 106¼ | 101 | 102½ | 68½ | 88 | 49 | 1,800 | 21,300 | 6% pfd. | 100 | 254,500 | 6.00 | 15.14 | 1.51 |
| 96⅝ | 101¼ | 67 | 77¼ | 58 | 71½ | 23⅛ | 14,400 | 202,800 | Columbian Carbon | No | 538,154 | 3.40 | 3.93 | 2.17 |
| 21⅝ | 23⅞ | 16½ | 36¾ | 15¾ | 57¼ | 9 | 204,100 | 1,404,100 | Commer. Solvents | No | 2,635,371 | .85 | .89 | .88 |
| 73 | 78⅛ | 60 | 84½ | 55½ | 90⅝ | 45⅜ | 49,300 | 374,700 | Corn Products | 25 | 2,530,000 | 3.00 | 3.16 | 3.87 |
| 155 | 165 | 148¼ | 150½ | 135 | 145¾ | 117½ | 400 | 8,600 | 7% cum. pfd. | 100 | 243,739 | 7.00 | 39.65 | 46.02 |
| 46 | 50⅜ | 35½ | 55¼ | 29 | 33⅞ | 10 | 4,500 | 29,300 | Devoe & Rayn. A | No | 95,000 | 2.00 | 2.36 | 3.82 |
| 144½ | 145½ | 86⅝ | 103⅞ | 80 | 95⅞ | 32⅛ | 43,200 | 873,000 | DuPont de Nemours | 20 | 10,871,997 | 3.15 | 3.63 | 2.93 |
| 131⅛ | 132 | 126⅞ | 128½ | 115 | 117 | 97½ | 4,600 | 35,600 | 6% cum. deb. | 100 | 1,092,699 | 6.00 | 42.73 | 35.58 |
| 171 | 172 | 110½ | 116½ | 79 | 89¾ | 46 | 10,600 | 200,300 | Eastman Kodak | No | 2,250,921 | 4.00 | 6.28 | 4.76 |
| 155 | 164 | 141 | 147 | 120 | 130 | 110 | 130 | 5,050 | 6% cum. pfd. | 100 | 61,657 | 6.00 | 235.22 | 180.34 |
| 29⅜ | 29¾ | 17¼ | 50⅜ | 21½ | 49⅜ | 16⅛ | 43,900 | 273,300 | Freeport Texas | 10 | 784,664 | 2.00 | 1.76 | 3.01 |
| 120 | 124 | 112½ | 160⅛ | 113½ | 160⅛ | 97 | ...... | 1,960 | 6% conv. pfd. | 100 | 25,000 | 6.00 | 120.08 | 156.73 |
| 40⅞ | 41¾ | 23⅜ | 28⅜ | 15⅝ | 20 | 3¾ | 32,600 | 422,700 | Glidden Co. | No | 603,304 | .90 | ..... | 1.54 |
| 109 | 111 | 104⅞ | 107½ | 83 | 91½ | 48 | 690 | 8,450 | Glidden, 6% pfd. | 100 | 63,044 | 7.00 | ..... | 22.60 |
| 115 | 117½ | 85 | 96⅞ | 74 | 85⅞ | 65 | 1,600 | 52,500 | Hazel Atlas | 25 | 434,409 | 5.00 | 5.21 | 6.22 |
| 87¼ | 90 | 71 | 81⅝ | 59 | 68⅝ | 15 | 2,400 | 58,700 | Hercules Powder | No | 582,679 | 3.00 | 3.94 | 2.79 |
| 126½ | 128 | 122 | 125¾ | 111 | 110⅛ | 85 | 650 | 5,550 | 7% cum. pfd. | 100 | 105,765 | 7.00 | 28.79 | 22.38 |
| 31¾ | 36⅜ | 23½ | 32 | 19⅜ | 85 | 24 | 33,400 | 448,900 | Industrial Rayon | No | 600,000 | 1.68 | 2.23 | 3.01 |
| 3¼ | 5 | 2⅝ | 6⅛ | 2 | 5⅞ | ⅞ | 10,000 | 138,800 | Intern. Agricul. | No | 436,049 | None | p—.99 | p .69 |
| 31½ | 42¾ | 26 | 37¼ | 15 | 23½ | 5 | 3,300 | 49,600 | 7% cum. pr. pfd. | 100 | 100,000 | None | p2.69 | p4.00 |
| 37⅞ | 38⅛ | 22¼ | 29¼ | 21 | 23¼ | 6¾ | 336,300 | 2,035,700 | Intern. Nickel | No | 14,584,025 | .60 | 1.14 | .53 |
| 27⅛ | 36¼ | 25¼ | 32 | 21 | 27¾ | 13¾ | 2,400 | 27,900 | Intern. Salt | No | 240,000 | 1.50 | 2.02 | 2.04 |
| 33 | 36¼ | 31 | 33⅛ | 15¾ | 22 | 7½ | 4,200 | 55,300 | Kellogg (Spencer) | No | 500,000 | 1.60 | v2.22 | v3.01 |
| 46 | 49¼ | 21½ | 43⅞ | 22½ | 37⅜ | 4⅜ | 41,900 | 790,900 | Libbey Owens Ford | No | 2,559,042 | 1.20 | 1.25 | 1.64 |
| 34¾ | 36¼ | 24½ | 35⅜ | 16⅛ | 50 | 10¼ | 38,300 | 227,300 | Liquid Carbonic | No | 342,406 | 1.25 | ..... | v1.05 |
| 32¼ | 33¾ | 23¾ | 40¾ | 23½ | 46⅝ | 14 | 18,000 | 269,800 | Mathieson Alkali | No | 650,436 | 1.50 | 1.20 | 1.70 |
| 93½ | 94¾ | 55 | 61⅝ | 39 | 83 | 25 | 7,300 | 188,800 | Monsanto Chem. | 10 | 864,000 | 1.25 | 3.03 | 2.57 |
| 205 | 205 | 145 | 170 | 135 | 140 | 43¼ | 1,700 | 19,900 | National Lead | 100 | 309,831 | 5.00 | 8.38 | 6.98 |
| 161 | 162½ | 150 | 146½ | 122 | 128¼ | 101 | 200 | 4,540 | 7% cum. "A" pfd | 100 | 243,676 | 7.00 | 20.12 | 18.35 |
| 135¼ | 140½ | 121⅝ | 121½ | 100½ | 109⅛ | 75 | 320 | 4,190 | 6% cum. "B" pfd. | 100 | 103,277 | 6.00 | 35.36 | 30.45 |
| 8⅞ | 9⅞ | 4⅜ | 13 | 5½ | 11¾ | 1⅜ | 57,500 | 202,500 | Newport Industries | 1 | 519,347 | None | .31 | .05 |
| 127¾ | 129 | 80 | 94 | 60 | 96¾ | 31½ | 20,100 | 191,100 | Owens-Illinois Glass | 25 | 1,200,000 | 4.00 | 5.41 | 4.86 |
| 47¾ | 53¾ | 42⅜ | 44⅜ | 33⅛ | 47½ | 19⅝ | 22,900 | 312,800 | Procter & Gamble | No | 6,410,000 | 1.70 | p 2.23 | p 2.11 |
| 120 | 121 | 115 | 117 | 102½ | 110¾ | 97 | 1,880 | 7,540 | 5% pfd. (ser. 2-1-29) | 100 | 171,569 | 5.00 | p88.13 | p83.69 |
| 7⅜ | 7⅜ | 4 | 6¾ | 3⅛ | 7¼ | 1⅜ | 27,600 | 170,600 | Tenn. Corp. | 5 | 857,896 | None | .27 | — .11 |
| 31¼ | 36¾ | 28¾ | 43¼ | 30 | 45¼ | 15¼ | 55,600 | 481,400 | Texas Gulf Sulphur | No | 2,540,000 | 2.00 | 1.81 | 2.93 |
| 73½ | 74¼ | 44 | 50⅞ | 35⅞ | 51⅞ | 19¾ | 63,700 | 1,074,400 | Union Carbide & Carbon | No | 9,000,743 | 1.60 | 2.28 | 1.59 |
| 76½ | 78 | 46 | 50⅜ | 35 | 37¾ | 10¼ | 7,500 | 222,500 | United Carbon | No | 370,127 | 2.40 | 3.55 | 1.39 |
| 47 | 49 | 35⅛ | 64¾ | 32 | 94 | 13½ | 33,900 | 337,300 | U. S. Indus. Alco. | No | 391,033 | None | 4.04 | 3.56 |
| 20¼ | 21¾ | 11¼ | 31¾ | 14 | 36¼ | 7⅝ | 50,700 | 403,900 | Vanadium Corp.-Amer. | No | 366,637 | None | —2.29 | —2.40 |
| 4⅛ | 4⅝ | 2½ | 5⅜ | 1⅞ | 7⅜ | ⅝ | 12,700 | 148,100 | Virginia-Caro. Chem. | No | 486,000 | None | p—.79 | p—2.46 |
| 31⅝ | 32⅜ | 17½ | 26 | 10 | 26½ | 3⅜ | 23,300 | 235,200 | 6% cum. part. pfd. | 100 | 213,392 | None | p4.20 | p .52 |
| 115 | 120½ | 85 | 84 | 59¾ | 63½ | 35⅜ | 300 | 10,800 | 7% cum. prior pfd. | 100 | 60,000 | None | p23.50 | p9.06 |
| 24¼ | 25 | 16¾ | 27¼ | 14⅞ | 20⅛ | 5 | 16,900 | 114,500 | Westvaco Chlorine | No | 284,962 | .40 | 1.55 | 1.08 |

### NEW YORK CURB EXCHANGE

| 1935 November xLast | 1935 November High | 1935 November Low | 1934 High | 1934 Low | 1933 High | 1933 Low | Sales x Nov. 1935 | Sales 1935 | Stocks | Par $ | Shares Listed | An. Rate* | Earnings 1934 | Earnings 1933 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 28⅜ | 29⅜ | 15 | 22½ | 14⅝ | 16½ | 3¼ | 63,900 | 782,900 | Amer. Cyanamid "B" | No | 2,404,194 | m .10 | .99 | .99 |
| 3½ | 4 | 2 | 4⅛ | 2⅜ | 4½ | 1 | 1,200 | 11,800 | British Celanese Am. R. | 10 | 2,806,000 | None | ..... | ..... |
| 110 | 112½ | 90 | 105¼ | 81 | 110 | 27 | 1,600 | 23,685 | Celanese, 7% cum. 1st pfd. | 100 | 144,379 | 7.00 | 16.37 | 32.24 |
| 107 | 111¼ | 97½ | 102 | 83 | 90 | 51 | 1,525 | 7,450 | 7% cum. prior pfd. | 100 | 113,668 | 7.00 | 28.13 | 47.98 |
| 13 | 15 | 7 | 19 | 7 | 26⅞ | 2 | 3,900 | 13,500 | Celluloid Corp. | 15 | 194,952 | None | —1.67 | —1.00 |
| 13⅞ | 14½ | 11⅝ | 14¾ | 10½ | 11⅝ | 4⅛ | 1,400 | 9,300 | Courtaulds' Ltd. | 1 £ | 24,000,000 | 7½% | 7.57% | 8.98% |
| 101 | 105½ | 80½ | 91 | 67½ | 78 | 30 | 4,800 | 72,100 | Dow Chemical | No | 945,000 | 2.00 | 3.32 | †3.60 |
| 10¼ | 12½ | 6¼ | 10¾ | 4 | 8 | ½ | 12,500 | 92,900 | Duval Texas Sulphur | No | 500,000 | None | ..... | z .08 |
| 55 | 56 | 37 | 40¾ | 19 | 19 | 8 | 1,100 | 18,700 | Heyden Chem. Corp. | 10 | 147,600 | 1.35 | 3.07 | 2.74 |
| 98½ | 99⅞ | 46¾ | 57¼ | 39 | 39⅞ | 13 | 11,000 | 129,000 | Pittsburgh Plate Glass | 25 | 2,141,305 | 1.40 | 2.69 | 1.87 |
| 127 | 128 | 84 | 90¼ | 47¼ | 47 | 12⅞ | 5,050 | 13,410 | Sherwin Williams | 25 | 635,583 | 3.00 | ..... | y3.54 |
| 107 | 113½ | 106 | 109¾ | 100 | 99 | 80 | 950 | 5,980 | 6% pfd. AA. cum. | 100 | 155,521 | 6.00 | ..... | y20.78 |

### PHILADELPHIA STOCK EXCHANGE

| 1935 November xLast | 1935 November High | 1935 November Low | 1934 High | 1934 Low | 1933 High | 1933 Low | Sales x Nov. 1935 | Sales 1935 | Stocks | Par $ | Shares Listed | An. Rate* | Earnings 1934 | Earnings 1933 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 115 | 116 | 76½ | 75 | 50¼ | 57 | 25¼ | 320 | 6,369 | Pennsylvania Salt | 50 | 150,000 | 4.00 | p5.94 | p5.07 |

## Bonds

### NEW YORK STOCK EXCHANGE

| 1935 November xLast | 1935 November High | 1935 November Low | 1934 High | 1934 Low | 1933 High | 1933 Low | Sales x Nov. 1935 | Sales 1935 | Bonds | Date Due | Int. % | Int. Period | Out-standing $ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 113 | 113¾ | 104½ | 106¾ | 83⅞ | 89 | 64 | 172,000 | 5,115,000 | Amer. I. G. Chem. Conv. 5½'s | 1949 | 5½ | M. N. | 29,929,000 |
| 22⅝ | 29¾ | 7⅜ | 17¾ | 5 | 14⅛ | 2⅛ | 303,000 | 3,021,000 | Anglo Chilean s. f. deb. 7's | 1945 | 7 | M. N. | 12,700,000 |
| 91⅞ | 92 | 77⅜ | 88 | 61½ | 74⅞ | 37 | 80,000 | 659,000 | By-Products Coke Corp. 1st 5½'s "A" | 1945 | 5½ | M. N. | 4,932,000 |
| 99½ | 100¼ | 91¼ | 92 | 62 | 65 | 38½ | 160,000 | 1,504,000 | Int. Agric. Corp. 1st Coll. tr. stpd. to 1942 | 1942 | 5 | M. N. | 5,994,100 |
| 18¾ | 21¼ | 7 | 19½ | 5⅛ | 14⅞ | 2½ | 1,268,000 | 11,859,000 | Lautaro Nitrate conv. b's | 1954 | 6 | J. J. | 31,357,000 |
| 70 | 94 | 65 | 98½ | 89⅞ | 99⅛ | 87 | 15,000 | 935,000 | Montecatini Min & Agric. det. 7's with war. | 1937 | 7 | J. J. | 7,075,045 |
| 32¾ | 38 | 32⅛ | 74½ | 34½ | 62 | 33¾ | ...... | 37,000 | Ruhr Chem. 6's | 1948 | 6 | A. O. | 3,156,000 |
| 103 | 103½ | 91½ | 90 | 65½ | 76 | 50 | 21,000 | 926,000 | Tenn. Corp. deb. 6's "B" | 1944 | 6 | M. S. | 3,007,900 |
| 87½ | 94½ | 66 | 89½ | 62 | 81 | 34¾ | 131,000 | 1,887,000 | Vanadium Corp. conv. 5's | 1941 | 5 | A. O. | 4,261,000 |

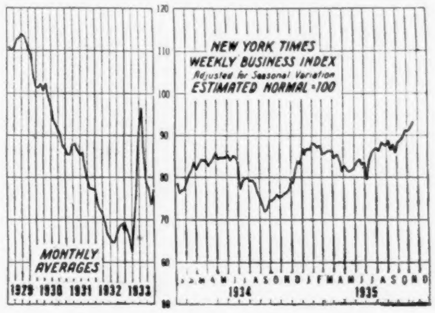
† Years ended 5-31-34 and 35; m Last paid, no regular rate; p Years ended 6-30-35 and 6-30-34; v Year ended 8-1-35; x Nov. 16; y Year ended 8-31-34; z Year ended 8-31-34; * Including extras.

# *Industrial Trends*

### *¶Business Close to Highest Peak Since Pre-Depression Period — Administration Spokesmen Seek to Reassure on Budget and New Legislation—*

Business news remains cheerful despite a number of uncertainties, mostly connected with the constitutionality or unconstitutionality of much of the more important "New Deal" legislation. Retail trade throughout the nation remains ahead of the corresponding period of last year, except in the Metropolitan area of N. Y., where department sales for the 1st 15 days were off 4.7% from the same period of '34. This condition is regarded as strictly a temporary one caused by a spell of unusually warm weather. Wholesale trade has spurted ahead of the rate that prevailed in October. Retail and wholesale trade for the Christmas period is expected to "top" any totals reached in the past 5 years.

The heavy industries are busy. Steel activity in the 3rd week of November reached 53.7%, the best production since Jan. 18, '34. With the automobile shows over production schedules have been stepped up to a rate of approximately 300,000 units monthly, and indications are that this rate will be maintained through the spring period. The textile, tanning and paper industries are holding up exceedingly well. Electrical consumption continues to register new all-time highs, and car-loadings are in satisfactory volume. One of the most encouraging signs is the improvement in construction totals, particularly those figures for residential building and modernization.




*Fall season brings rapid upturn in the business curve.*

Commodity prices generally failed to keep pace with the sharp rise in the stock market. There was very little snap to the grain markets, but the metals were firmer, although no further price advances were registered by lead, copper or zinc. Tin made a modest advance.

*The N. Y. Times* Index of Business Activity is showing constant gains, and one of the most encouraging signs is that higher levels are being reached each successive week in practically every one of the indices in the group.

**Uneventful Contract Season**

Consumption of chemicals in the 1st 3 weeks of November held very closely to the pace set in October, and was greatly in excess of the November totals of last year. The contract season is now in full swing, and, with but very few exceptions, '36 contract prices are at '35 levels or higher. A few of the detergent chemicals, notably trisodium phosphate, are weak. Alkali prices for next year duplicate the current schedule. Chlorine will cost consumers $3 a ton more, and bichromate manufacturers were forced to raise quotations ⅜c per lb. in the face of mounting chrome ore costs. Naval stores turned soft in the 1st half of last month after having made substantial gains during October. Producers and marketing factors are very much "up in the air" as to what form the proposed marketing agreement will take and what provisions will be made for disposing of the large stocks now held by the government. The immediate outlook in rosin and turpentine is very indefinite.

**Business and "New Deal" at Cross-roads**

Business leaders generally are encouraged at the progress that has been made along the path of recovery in the past 11 months, but are frankly apprehensive as to the ultimate effect on business of much of the legislation that has been enacted in the last 2 sessions. Another uncertainty is appearing, and that is what the final outcome will be of the AAA, the SEC, the Guffey Coal Act, and many of the other alphabetical agencies that have been set up in the past 2 years. These are now openly being challenged, and within the next few months may reach the U. S. Supreme Court for a final decision. But of still greater importance is the question of government spending. The President issued informally a statement last month which seemed to indicate that he was prepared to start retrenching, but until the final budget measure is prepared and made public there will be serious doubt as to the degree of economy that Mr. Roosevelt has in mind and how successful he will be in the next session in preventing the radical elements from further inflationary measures. But, in the meantime, the outlook for business over the next few months is bright.

## Statistics of Business

| | October 1935 | October 1934 | September 1935 | September 1934 | August 1935 | August 1934 |
|---|---|---|---|---|---|---|
| Automotive production .... | ...... | 132,488 | 89,805 | 170,007 | 240,051 | 234,811 |
| Bldg. contracts*‡ ........ | $200,864 | $135,225 | $167,376 | $110,151 | $168,557 | $119,592 |
| Failures, Dun & Bradstreet | ...... | 1,091 | 806 | 790 | 910 | 929 |
| Merchandise imports‡ ..... | $189,240 | $129,635 | $161,653 | $131,658 | $169,030 | $119,513 |
| Merchandise exports‡ ..... | $221,215 | $206,413 | $198,189 | $191,313 | $172,204 | $171,984 |
| **Newsprint Production** | | | | | | |
| Canada, tons .......... | ...... | ...... | 223,892 | 196,172 | 235,573 | 216,164 |
| U. S., tons ............ | ...... | ...... | 71,416 | 74,117 | 75,187 | 80,903 |
| Newfoundland, tons .... | ...... | ...... | ...... | 25,847 | 29,565 | 30,223 |
| Mexico, tons .......... | ...... | ...... | ...... | ...... | 2,069 | 1,868 |
| Total, tons ........... | ...... | ...... | ...... | ...... | 342,394 | 329,158 |
| Plate glass prod., sq. ft. ... | ...... | 7,512,052 | 14,404,060 | 6,737,782 | 14,526,312 | 7,449,906 |
| Steel ingots production .... | 3,116,184 | 1,481,902 | 2,829,835 | 1,268,977 | 2,919,326 | 1,381,350 |
| Steel activity, % capacity.. | 52.13 | 24.59 | 51.13 | 23.05 | 48.84 | 23.24 |
| Pig iron production, tons .. | 1,978,411 | 951,062 | 1,776,476 | 898,000 | 1,761,286 | 1,054,000 |
| U. S. consumption, crude rubber, tons ......... | ...... | ...... | ...... | ...... | 39,242 | 33,216 |
| Tire shipments ......... | ...... | ...... | ...... | ...... | 4,739,259 | 4,308,270 |
| Tire production ........ | ...... | ...... | ...... | ...... | 3,992,800 | 3,532,631 |
| Tire inventory ......... | ...... | ...... | ...... | ...... | 7,805,054 | 8,697,151 |
| **Dept. of Labor Indices†** | | | | | | |
| Factory payrolls, totals†.. | ...... | ...... | 72.1 | z58.0 | z69.6 | 65.3 |
| Factory employment† ... | ...... | ...... | 83.6 | z75.9 | z81.8 | 80.4 |
| Chemical price index† ... | ...... | ...... | 80.3 | 84.3 | 79.2 | 84.6 |
| Chemical employment†a .. | ...... | ...... | 110.8 | 107.6 | z106.9 | 110.9 |
| Chemical payrolls†a ..... | ...... | ...... | 97.8 | 87.9 | z95.4 | 96.5 |
| **Chemicals and Related Products** | | | | | | |
| Exports‡ ............. | $3,959 | $7,793 | $8,692 | $7,737 | $8,878 | $7,722 |
| Imports‡ ............. | $5,010 | $4,955 | $4,530 | $4,184 | $3,703 | $3,917 |
| Stocks, mfd. goods† ..... | ...... | ...... | 119 | 121 | 114 | 119 |
| Stocks, raw materials† .. | ...... | ...... | 99 | 109 | 79 | 92 |
| Cement prod., ratio of prod. to capacity ............ | ...... | ...... | 32.6 | 34.8 | 31.8 | 34.5 |
| Anthracite prod., tons .... | y4,271,000 | 4,729,000 | 4,172,000 | 3,977,000 | 2,591.000 | 3,584.000 |
| Bituminous prod., tons ... | y36,697,000 | 32,807,000 | 24,944,000 | 27,772,000 | 26,112,000 | 27,452,000 |
| Boot and shoe prod. ...... | ...... | ...... | 33,149,780 | 28,183,793 | 36,508,216 | ...... |

| Week Ending | Carloadings 1935 | Carloadings 1934 | Carloadings % of Change | Electrical Output§ 1935 | Electrical Output§ 1934 | Electrical Output§ % of Change | Jour. of Com. Price Index | National Fertilizer Association Indices Fats & Oils | Chem. & Drugs | Mixed Fert. | Fert. Mat. | All Groups | ‡‡Labor Dept. Chem. & Drug Price Index | % Steel Activity | N. Y. Times Index Bus. Act. | Fisher's Index Pur. Power |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Oct. 26.... | 707,826 | 624,808 | +13.3 | 1,895,817 | 1,677,229 | +13.0 | 81.5 | 76.5 | 95.6 | 70.9 | 66.0 | 79.3 | 81.3 | 51.9 | 92.1 | 117.3 |
| Nov. 2.... | 680,662 | 613,048 | +11.0 | 1,897,180 | 1,669,217 | +13.7 | 80.3 | 76.4 | 95.6 | 70.9 | 65.9 | 79.3 | 81.1 | 50.9 | 91.0 | 117.6 |
| Nov. 9.... | 653,525 | 594,790 | + 9.9 | 1,913,684 | 1,675,760 | +14.2 | 81.4 | 77.3 | 95.6 | 70.9 | 66.0 | 79.4 | 81.1 | 52.6 | 92.1 | 117.7 |
| Nov. 16.... | 628,330 | 585,034 | + 7.4 | 1,938,560 | 1,691,046 | +14.6 | 82.2 | 81.9 | 95.6 | 70.5 | 66.0 | 79.5 | 81.1 | 53.7 | .... | 117.6 |
| Nov. 23.... | ...... | ...... | ..... | ....... | ....... | ..... | ... | .... | .... | .... | .... | .... | .... | .... | .... | ..... |

* 37 states; † Dept. of Labor, 3 year average, 1923-1925 = 100.0; ‡ 000 omitted; § K.W.H., 000 omitted; *a* Includes all allied products but not petroleum refining; ‡‡ 1926-1928 = 100.0; *y* Preliminary; *z* Revised.

# Prices Current

**Heavy Chemicals, Coal-tar Products, Dye-and-Tanstuffs, Colors and Pigments, Fillers and Sizes, Fertilizers and Insecticide Materials, Petroleum Solvents and Chemicals, Naval Stores, Fats and Oils, etc.**

Chemical prices quoted are of American manufacturers for spot New York, immediate shipment, unless otherwise specified. Products sold f. o. b. works are specified as such. Import chemicals are so designated. Resale stocks when a market factor are quoted in addition to maker's prices and indicated "second hands."

Oils are quoted spot New York, ex-dock. Quotations f.o.b. mills, or for spot goods at the Pacific Coast are so designated.

Raw materials are quoted New York, f.o.b., or ex-dock. Materials sold f.o.b. works or delivered are so designated.

The current range is not "bid and asked," but are prices from different sellers, based on varying grades or quantities or both. Containers named are the original packages most commonly used.

**Purchasing Power of the Dollar: 1926 Average—$1.00 - 1934 Average $1.31 - Jan. 1935 $1.23 - Nov. 1935 $1.175***

| | Current Market | | 1935 | | 1934 | |
|---|---|---|---|---|---|---|
| | | | Low | High | Low | High |
| Acetaldehyde, drs c-l, wks lb. | ... | .14 | ... | .14 | .14 | .16½ |
| Acetaldol, 95%, 50 gal drs wks ..........lb. | .21 | .25 | .21 | .25 | .21 | .31 |
| Acetamide, tech, lcl, kegs..lb. | .38 | .43 | .38 | .43 | .40 | 1.35 |
| Acetanalid, tech, 150 lb bbls lb. | .24 | .26 | .24 | .26 | .24 | .26 |
| Acetic Anhydride, 100 lb cbys ..........lb. | .21 | .25 | .21 | .25 | .21 | .25 |
| Acetin, tech, drs ..........lb. | .22 | .24 | .22 | .24 | .22 | .32 |
| Acetone, tks, delv ..........lb. | .11 | .12 | .11 | .12 | .10 | .12 |
| drs, c-l, delv ..........lb. | ... | .12 | ... | .12 | .12 | .12 |
| Acetyl chloride, 100 lb cbys lb. | .55 | .68 | .55 | .68 | .55 | .68 |
| **ACIDS** | | | | | | |
| Abietic, kgs, bbls ..........lb. | .06¾ | .07 | .06¾ | .07 | .06 | .07 |
| Acetic, 28%, 400 lb bbls, c-l, wks ..........100 lbs. | ... | 2.45 | 2.40 | 2.45 | 2.40 | 2.91 |
| glacial, bbls, c-l, wks 100 lbs. | ... | 8.43 | 8.25 | 8.43 | 8.25 | 10.02 |
| glacial, USP, bbls, c-l, wks ..........100 lbs. | ... | 12.43 | 12.25 | 12.43 | ... | 12.25 |
| Adipic, kgs, bbls ..........lb. | ... | .72 | ... | .72 | .72 | .72 |
| Anthranilic, refd, bbls ....lb. | .85 | .95 | .85 | .95 | .85 | .95 |
| tech, bbls ..........lb. | ... | .75 | ... | .75 | .65 | .75 |
| Battery, cbys, delv ..100 lbs. | 1.60 | 2.25 | 1.60 | 2.25 | 1.60 | 2.25 |
| Benzoic, tech, 100 lb kgs..lb. | .40 | .45 | .40 | .45 | .40 | .45 |
| USP, 100 lb kgs ..........lb. | .54 | .59 | .54 | .59 | ... | ... |
| Boric, tech, gran, 80 tons, bgs, delv ..........ton *a* | ... | 95.00 | 80.00 | 95.00 | 80.00 | 80.00 |
| Broenner's, bbls ..........lb. | 1.20 | 1.25 | 1.20 | 1.25 | 1.20 | 1.25 |
| Butyric, 95%, cbys ..........lb. | .53 | .60 | .53 | .60 | .53 | .85 |
| edible, c-l, wks, cbys ...lb. | 1.20 | 1.30 | 1.20 | 1.30 | 1.20 | 1.30 |
| synthetic, c-l, drs ..........lb. | ... | .22 | ... | .22 | .22 | .22 |
| wks ..........lb. | ... | .23 | ... | .23 | .23 | .23 |
| tks, wks ..........lb. | ... | .21 | ... | .21 | .21 | .21 |
| Camphoric, drs ..........lb. | ... | 5.25 | ... | 5.25 | 5.25 | 5.25 |
| Chicago, bbls. ..........lb. | ... | 2.10 | ... | 2.10 | 2.10 | 2.10 |
| Chlorosulfonic, 1500 lb drs, wks ..........lb. | .03½ | .05 | .03½ | .05½ | .04½ | .05½ |
| Chromic, 99¼%, drs, delv lb. | .14¼ | .16¼ | .13¾ | .16¼ | .13½ | .15¾ |
| Citric, USP, crys, 230 lb bbls ..........lb. *b* | .28 | .29 | .28 | .29 | .28 | .30 |
| anhyd, gran, drs ......lb. *b* | ... | .31 | ... | .31 | .31 | .31 |
| Cleve's, 250 lb bbls ..........lb. | .52 | .54 | .52 | .54 | .52 | .54 |
| Cresylic, 99%, straw, HB, drs, wks, frt equal ..gal. | .45 | .47 | .46 | .48 | .46 | .47 |
| 99%, straw, LB, drs, wks, frt equal ..........gal. | .64 | .65 | .64 | .65 | .64 | .65 |
| resin grade, drs, wks, frt equal ..........gal. | .54 | .55 | .54 | .55 | .54 | .55 |
| Crotonic, drs ..........lb. | .90 | 1.00 | .90 | 1.00 | .90 | 1.00 |
| Formic, tech, 140 lb drs ..lb. | .11 | .13 | .11 | .13 | .11 | .13 |
| Fumaric, bbls ..........lb. | ... | .60 | ... | .60 | ... | ... |
| Fuming, see Sulfuric (Oleum) | | | | | | |
| Fuoric, tech, 90%, 100 lb. drs. ..........lb. | ... | .35 | ... | .35 | ... | .35 |
| Gallic, tech, bbls ..........lb. | .65 | .68 | .65 | .68 | .60 | .70 |
| USP, bbls ..........lb. | .70 | .80 | .70 | .80 | .74 | .80 |
| Gamma, 225 lb bbls, wks...lb. | .77 | .79 | .77 | .79 | .77 | .79 |
| H, 225 lb. bbls, wks ..........lb. | .50 | .55 | .50 | .55 | .50 | .70 |
| Hydriodic, USP, 10% sol. cbys ..........lb. | .50 | .51 | .50 | .51 | .50 | .51 |
| Hydrobromic, 48% com 155 lb cbys, wks ..........lb. | .45 | .48 | .45 | .48 | .45 | .48 |
| Hydrochloric, see muriatic. | | | | | | |
| Hydrocyanic, cyl, wks ....lb. | .80 | 1.30 | .80 | 1.30 | .80 | 1.30 |
| Hydrofluoric, 30%, 400 lb bbls, wks ..........lb. | .07 | .07½ | .07 | .07½ | .07 | .07½ |
| Hydrofluosilicic, 35%, 400 bbls, wks ..........lb. | .11 | .12 | .11 | .12 | .11 | .12 |
| Lactic, 22%, dark, 500 lb bbls ..........lb. | .04½ | .05 | .04½ | .05 | .04 | .05 |
| 22%, light refd, bbls ..lb. | .06½ | .07 | .06½ | .07 | .06½ | .07 |
| 44%, light, 500 lb bbls ..lb. | .11½ | .12 | .11½ | .12 | .11½ | .12 |
| 44%, dark, 500 lb bbls ..lb. | .09½ | .10 | .09½ | .10 | .09 | .10 |
| 50%, water white, 500 lb bbls ..........lb. | ... | .14½ | ... | ... | ... | ... |
| USP X, 85%, cbys ....lb. | .45 | .50 | .45 | .50 | ... | ... |
| Laurent's, 250 lb bbls ....lb. | .36 | .37 | .36 | .37 | .36 | .37 |
| Linoleic, bbls ..........lb. | .16 | .16 | .16 | .16 | .16 | .16 |
| Maleic, powd, kgs ..........lb. | .29 | .32 | .29 | .32 | .25 | .32 |
| Malic, powd, kgs ..........lb. | .45 | .60 | .45 | .60 | .45 | .60 |
| Metanillic, 250 lb bbls ....lb. | .60 | .65 | .60 | .65 | .60 | .65 |
| Mixed, tks, wks ......N unit | .06½ | .07¼ | .06½ | .07¼ | .06½ | .07¼ |
| S unit | .008 | .009 | .008 | .009 | .008 | .01 |
| Monochloracetic, tech, bbls lb. | .16 | .18 | .16 | .18 | .16 | .18 |
| Monosulfonic, bbls ......lb. | 1.50 | 1.60 | 1.50 | 1.60 | 1.50 | 1.60 |
| Muriatic, 18°, 120 lb cbys, c-l, wks ..........100 lb. | ... | 1.35 | ... | 1.35 | ... | 1.35 |
| tks, wks ..........100 lb. | ... | 1.00 | ... | 1.00 | ... | 1.00 |

*a* Powdered boric acid $5 a ton higher in each case; USP $15 higher; *b* Powdered citric is ½c higher; kegs are in each case ½c higher than bbls.
* Because of the publication of the December issue ahead of the usual date the price changes are for the first 3 weeks of November only.

| | Current Market | | 1935 | | 1934 | |
|---|---|---|---|---|---|---|
| | | | Low | High | Low | High |
| Muriatic (cont.): | | | | | | |
| 20°, cbys, c-l, wks ..100 lb. | ... | 1.45 | ... | 1.45 | ... | 1.45 |
| tks, wks ..........100 lb. | ... | 1.20 | ... | 1.20 | ... | 1.20 |
| 22°, c-l, cbys, wks ..100 lb. | ... | 1.95 | ... | 1.95 | ... | 1.95 |
| tks, wks ..........100 lb. | ... | 1.60 | ... | 1.60 | ... | 1.60 |
| CP, cbys ..........lb. | .06½ | .07⅛ | .06½ | .07⅛ | .06½ | .07⅛ |
| N & W, 250 lb bbls ..........lb. | .85 | .87 | .85 | .87 | .85 | .87 |
| Naphthenic, 240-280 s. v., drs ..........lb. | .11 | .14 | .11 | .14 | .10 | .13 |
| Sludges, drs ..........lb. | .06 | .10 | ... | ... | ... | ... |
| Naphthionic, tech, 250 lb bbls ..........lb. | .60 | .65 | .60 | .65 | .60 | .65 |
| Nitric, 36°, 135 lb cbys. c-l, wks ..........100 lb. *c* | ... | 5.00 | ... | 5.00 | ... | 5.00 |
| 38°, c-l, cbys, wks..100 lb. *c* | ... | 5.50 | ... | 5.50 | ... | 5.50 |
| 40°, cbys, c-l, wks..100 lb. *c* | ... | 6.00 | ... | 6.00 | ... | 6.00 |
| 42°, c-l, cbys, wks..100 lb. *c* | ... | 6.50 | ... | 6.50 | ... | 6.50 |
| CP, cbys, delv ..........lb. | .11½ | .12½ | .11½ | .12½ | .11½ | .12½ |
| Oxalic, 300 lb bbls, wks, or N. Y. ..........lb. | .11½ | .12½ | .11½ | .12½ | .11½ | .12½ |
| Phosphoric, 50%, USP, cbys ..........lb. | .14 | .14 | .14 | .14 | .14 | .14 |
| 50%, acid, c-l, drs, wks..lb. | .06 | .08 | .06 | .08 | .05 | .08 |
| 75%, acid, c-l, drs, wks..lb. | .09 | .10½ | .09 | .10½ | .07 | .10½ |
| Picramic, 300 lb bbls, wks.lb. | .65 | .70 | .65 | .70 | .65 | .70 |
| Picric, kgs, wks ..........lb. | .30 | .40 | .30 | .40 | .30 | .50 |
| Propionic, 98% wks, drs..lb. | ... | .35 | ... | .35 | ... | ... |
| 80% ..........lb. | .15 | .17½ | .15 | .17½ | ... | ... |
| Pyrogallic, crys, kgs, wks..lb. | 1.55 | 1.65 | 1.55 | 1.65 | 1.40 | 1.65 |
| Salicylic, tech, 125 lb bbls, wks ..........lb. | ... | .40 | ... | .40 | .33 | .40 |
| Sebacic, tech, drs, wks ....lb. | ... | .58 | ... | .58 | ... | .58 |
| Succinc, bbls ..........lb. | ... | .75 | ... | .75 | ... | ... |
| Sulfanilic, 250 lb bbls, wks lb. | .18 | .19 | .18 | .19 | .18 | .19 |
| Sulfuric, 60°, tks, wks ...ton | ... | 11.00 | ... | 11.00 | ... | 11.00 |
| c-l, cbys, wks ....100 lb. | ... | 1.10 | ... | 1.10 | ... | 1.10 |
| 66°, tks, wks ..........ton | ... | 15.50 | ... | 15.50 | 15.00 | 15.50 |
| c-l, cbys, wks ....100 lb. | ... | 1.35 | ... | 1.35 | ... | 1.35 |
| CP, cbys, wks ..........lb. | .06½ | .07½ | .06½ | .07½ | .06½ | .07½ |
| Fuming (Oleum) 20% tks, wks ..........ton | ... | 18.50 | ... | 18.50 | ... | 18.50 |
| Tannic, tech, 300 lb bbls...lb. | .23 | .40 | .23 | .40 | .23 | .40 |
| Tartaric, USP, gran powd, 300 lb bbls ..........lb. | ... | .24 | .24 | .25 | .25 | .26 |
| Tobias, 250 lb bbls..........lb. | .75 | .80 | .75 | .80 | .75 | .80 |
| Trichloroacetic bottles.....lb. | 2.45 | 2.75 | 2.45 | 2.75 | 2.00 | 2.75 |
| kgs ..........lb. | ... | 1.75 | ... | 1.75 | ... | 1.75 |
| Tungstic, tech, bbls ..........lb. | 1.50 | 1.60 | 1.50 | 1.60 | 1.35 | 1.70 |
| Vanadic, drs, wks ..........lb. | 1.10 | 1.20 | 1.10 | 1.20 | 1.10 | 1.20 |
| Albumen, light flake, 225 lb bbls ..........lb. | .50 | .60 | .45 | .60 | .35 | .53 |
| dark, bbls ..........lb. | .12 | .17 | .12 | .17 | .10 | .17 |
| egg, edible ..........lb. | ... | 1.05 | .85 | 1.05 | .82 | .92 |
| vegetable, edible ..........lb. | .65 | .70 | .65 | .70 | .65 | .70 |
| **ALCOHOLS** | | | | | | |
| Alcohol, Amyl (from Pentane) tks, delv ..........lb. | ... | .143 | ... | ... | ... | ... |
| c-l, drs, delv ..........lb. | ... | .150 | ... | ... | ... | ... |
| lcl, drs, delv ..........lb. | ... | .157 | ... | ... | ... | ... |
| Amyl, secondary, tks, delv ..........lb. | ... | .108 | ... | .108 | ... | .108 |
| Benzyl, bottles ..........lb. | .65 | 1.10 | .65 | 1.10 | .75 | 1.10 |
| Butyl, normal, tks, delv .lb. *d* | ... | .11 | .11 | .12 | .09½ | .12 |
| c-l, drs, delv ..........lb. *d* | ... | .12 | .12 | .13 | .10½ | .13 |
| Butyl, secondary, tks, delv ..........lb. *d* | ... | .096 | ... | .096 | .076 | .096 |
| c-l, drs, delv ..........lb. *d* | ... | .106 | ... | .106 | .086 | 1.06 |
| Capryl, drs, tech, wks ..lb. | ... | .85 | ... | .85 | .85 | .85 |
| Cinnamic, bottles ..........lb. | 3.25 | 3.65 | 3.25 | 3.65 | 3.25 | 3.65 |
| Denatured, No. 5, c-l, drs, wks ..........gal. *e* | ... | .49* | .34 | .49 | .30 | .34 |
| Western schedule, c-l, wks ..........gal. *e* | ... | .39½ | .38 | .39½ | ... | ... |
| Denatured, No. 1, tks, wks ..........gal. *e* | ... | .31 | .29½ | .31 | .29½ | .304 |
| c-l, drs, wks ..........gal. *e* | ... | .36 | .34½ | .36 | ... | ... |
| Western schedule, tks, wks ..........gal. *e* | ... | .35 | .32½ | .35 | ... | ... |
| c-l, drs, wks ..........gal. *e* | ... | .40 | .37½ | .40 | ... | ... |
| Diacetone, tech, tks, delv ..........lb. *f* | ... | .16 | ... | .16 | ... | ... |
| c-l, drs, delv ..........lb. *f* | ... | .17 | ... | .17 | ... | .17 |

*c* Yellow grades 25c per 100 lbs. less in each case; *d* Spot prices are 1c higher; *e* Anhydrous is 5c higher in each case; *f* Pure prices are 1c higher in each case; * Dealers are given 20% off this price.

ABBREVIATIONS—Anhydrous, anhyd; bags, bgs; barrels, bbls; carboys, cbys; carlots, c-l; less-than-carlots, lcl; drums, drs; kegs, kgs; powdered, powd; refined, ref'd; tanks, tks; works, f.o.b., wks.

# *Prices Current*



| | Current Market | | 1935 Low | 1935 High | 1934 Low | 1934 High |
|---|---|---|---|---|---|---|
| Alcohols (continued) | | | | | | |
| Ethyl, 190 proof, molasses, | | | | | | |
| tks ..................gal. g | ... | 4.10 | 4.08½ | 4.10 | ... | 4.08½ |
| c-l, drs ...........gal. g | 4.17 | 4.27 | 4.13½ | 4.27 | ... | 4.13½ |
| c-l, bbls ..........gal. g | 4.18 | 4.28 | 4.15½ | 4.28 | 4.12½ | 4.24½ |
| absolute, drs ......gal. g | 4.57½ | 6.11½ | 4.55½ | 6.11½ | ... | ... |
| Furfuryl, tech, 500 lb, | | | | | | |
| drs ....................lb. | ... | .35 | ... | .35 | .35 | .40 |
| Hexyl, secondary tks, delv lb. | ... | .11½ | ... | .11½ | ... | .11½ |
| c-l, drs, delv .........lb. | ... | .12½ | ... | .12½ | ... | .12½ |
| Normal, drs, wks ....lb. | 3.25 | 3.50 | 3.25 | 3.50 | 3.25 | 3.50 |
| Isoamyl, prim, cans, wks lb. | 4.00 | 4.50 | 4.00 | 4.50 | 4.00 | 4.50 |
| Isobutyl, refd, lcl, drs ..lb. | ... | .12 | .12 | .60 | .60 | .75 |
| c-l, drs ..............lb. | ... | .11½ | ... | ... | ... | ... |
| tks .....................lb. | ... | .10½ | ... | ... | ... | ... |
| Isopropyl, refd, c-l, drs..lb. | ... | .55 | ... | .55 | .45 | .55 |
| Propyl, norm, 50 gal drs gal. | ... | .75 | ... | .75 | ... | .75 |
| Special Solvent, tks, wks gal. | ... | .32 | ... | ... | ... | ... |
| Western points, tks, | | | | | | |
| wks .................gal. | ... | .35 | ... | ... | ... | ... |
| Aldehyde ammonia, 100 gal | | | | | | |
| drs .......................lb. | .80 | .82 | .80 | .82 | .80 | .82 |
| Alphanaphthol, crude, 300 lb | | | | | | |
| bbls ....................lb. | .60 | .65 | .60 | .65 | .65 | .70 |
| Alphanaphthylamine, 350 lb | | | | | | |
| bbls ....................lb. | .32 | .34 | .32 | .34 | .32 | .34 |
| Alum, ammonia, lump, c-l, | | | | | | |
| bbls, wks ........100 lb. | ... | 3.00 | ... | 3.00 | 2.90 | 3.00 |
| 25 bbls or more, | | | | | | |
| wks ............100 lb. | ... | 3.15 | ... | 3.15 | ... | 3.15 |
| less than 25 bbls, | | | | | | |
| wks ............100 lb. | ... | 3.25 | ... | 3.25 | ... | 3.25 |
| Granular, c-l, bbls, wks 100 lb. | ... | 2.75 | ... | 2.75 | ... | 2.75 |
| 25 bbls or more, wks 100 lb. | ... | 2.90 | ... | 2.90 | ... | 2.90 |
| Powd, c-l, bbls, wks 100 lb. | ... | 3.15 | ... | 3.15 | ... | 3.15 |
| 25 bbls or more, wks 100 lb. | ... | 3.30 | ... | 3.30 | ... | 3.30 |
| Chrome, bbls ......100 lb. | 7.00 | 7.25 | 7.00 | 7.25 | 6.50 | 7.25 |
| Potash, lump, c-l, bbls, | | | | | | |
| wks ............100 lb. | ... | 3.25 | ... | 3.25 | ... | 3.25 |
| 25 bbls or more, wks 100 lb. | ... | 3.40 | ... | 3.40 | ... | 3.40 |
| Granular, c-l, bbls, wks 100 lb. | ... | 3.40 | ... | 3.00 | ... | 3.00 |
| 25 bbls or more, bbls, | | | | | | |
| wks ............100 lb. | ... | 3.00 | ... | 3.15 | ... | 3.15 |
| Powd, c-l, bbls, wks 100 lb. | ... | 3.40 | ... | 3.40 | ... | 3.40 |
| 25 bbls or more, wks 100 lb. | ... | 3.55 | ... | 3.55 | .. | 3.55 |
| Soda, bbls, wks .....100 lb. | 4.00 | 4.15 | 4.00 | 4.15 | 3.50 | 4.15 |
| Aluminum metal, c-l | | | | | | |
| NY .............100 lb. | 19.00 | 20.00 | 19.00 | 23.30 | 20.00 | 24.30 |
| Acetate, CP, 20%, bbls lb. | .09 | .10 | .09 | .10 | .09 | .10 |
| Chloride anhyd, 99%, | | | | | | |
| wks ....................lb. | .07 | .12 | .07 | .12 | .07 | .12 |
| 93%, wks ..............lb. | .05 | .08 | .05 | .08 | .04 | .08 |
| Crystals, c-l, drs, wks ...lb. | .06½ | .07 | .06½ | .07 | .06½ | .01 |
| Solution, drs, wks ......lb. | .03 | .03½ | .03 | .03½ | .03 | .03½ |
| Hydrate, 96%, light, 90 lb. | | | | | | |
| bbls, delv ............lb. | .13 | .15 | .13 | .15 | .13 | .16½ |
| heavy, bbls, wks .....lb. | .04 | .04½ | .04 | .04½ | .04 | .04½ |
| Oleate, drs .............lb. | ... | .15¾ | ... | .15¾ | ... | .15¾ |
| Palmitate, bbls ........lb. | .21 | .22 | .20 | .22 | .19 | .21 |
| Resinate, pp., bbls .....lb. | ... | .15 | ... | .15 | .12½ | .15 |
| Stearate, 100 lb bbls....lb. | .18 | .20 | .17 | .20 | .17 | .18 |
| Sulfate, com, c-l, bgs, | | | | | | |
| wks ..............100 lb. | ... | 1.35 | ... | 1.35 | 1.35 | 1.35 |
| c-l, bbls, wks .....100 lb. | ... | 1.55 | ... | 1.55 | 1.55 | 1.55 |
| Sulfate, iron-free, c-l, bgs, | | | | | | |
| wks ............100 lb. | ... | 1.90 | ... | 1.90 | 1.90 | 1.90 |
| c-l, bbls, wks .....100 lb. | ... | 2.05 | ... | 2.05 | 2.05 | 2.05 |
| Aminoazobenzene, 110 lb | | | | | | |
| kgs .....................lb. | ... | 1.15 | ... | 1.15 | ... | 1.15 |
| Ammonia anhyd com, tks..lb. | .04½ | .05½ | .04½ | .05½ | .04½ | .05½ |
| Ammonia anhyd, 100 lb cyl lb. | .15¼ | .21½ | .15¼ | .21½ | .15¼ | .21½ |
| 26°, 800 lb drs, delv ....lb. | .02½ | .03 | .02½ | .03 | .02½ | .03 |
| Aqua 26° tks NH ....cont. | ... | .05 | ... | .05 | ... | .05 |
| tk wagon ..............lb. | ... | .024 | ... | .024 | ... | ... |
| Ammonium Acetate, kgs ..lb. | .26 | .33 | .26 | .33 | .26 | .33 |
| Bicarbonate, bbls, f.o.b. | | | | | | |
| plant ............100 lb. | 5.15 | 5.71 | 5.15 | 5.71 | 5.15 | 5.71 |
| Bifluoride, 300 lb bbls...lb. | .15 | .17 | .15 | .17 | .15 | .17 |
| carbonate, tech, 500 lb | | | | | | |
| bbls ....................lb. | .08 | .12 | .08 | .12 | .08 | .12 |
| Chloride, White, 100 lb | | | | | | |
| bbls, wks .........100 lb | 4.45 | 4.90 | 4.45 | 4.90 | 4.45 | 5.25 |
| Gray, 250 lb bbls wks...lb. | 5.00 | 5.75 | 5.00 | 5.75 | 5.00 | 5.75 |
| Lump, 500 lbs cks spot lb. | .10½ | .11 | .10½ | .11 | .10 | .11 |
| Lactate, 500 lb bbls ....lb. | .15 | .16 | .15 | .16 | .15 | .16 |
| Linoleate ..............lb. | .11 | .12 | .11 | .12 | .11 | .12 |
| Nitrate, tech, cks .......lb. | .04 | .05 | .04 | .05 | .03¾ | .05 |
| Oleate, drs ............lb. | ... | .10 | ... | .10 | ... | .10 |
| Oxalate, neut, cryst, powd, | | | | | | |
| bbls ....................lb. | .26 | .27 | .26 | .27 | .26 | .27 |
| pure, cryst, bbls, kgs..lb. | .27 | .28 | .27 | .28 | .27 | .28 |
| Serchlorate, kgs .......lb. | ... | .16 | ... | .16 | .16 | .16 |
| Persulfate, 112 lb kgs ..lb. | .22½ | .25 | .22½ | .25 | .20 | .25 |
| Phosphate, dibasic tech, | | | | | | |
| powd, 325 lb bbls ....lb. | .08 | .10 | .08 | .10 | .08 | .11½ |
| Sulfate, dom, f.o.b., bulk.ton | 22.00 | 24.00 | 20.00 | 24.00 | 22.00 | 25.00 |
| 200 lb bgs ..........ton | ... | nom. | 25.50 | 25.80 | ... | 25.80 |
| 100 lb bgs ...........lb. | ... | nom. | 26.00 | 26.50 | ... | 26.50 |
| Sulfocyanide, kgs ......lb. | ... | .50 | ... | .50 | ... | .50 |
| Amyl Acetate (from pentane) | | | | | | |
| tks delv ..............lb. | ... | .13½ | ... | .13½ | ... | .13½ |
| tech, drs, delv .......lb. | .142 | .149 | .142 | .149 | .142 | .149 |
| secondary, tks, delv ..lb. | ... | .108 | ... | .108 | .09 | .108 |
| c-l, drs, delv .........lb. | .118 | .123 | .118 | .123 | ... | .123 |

g Grain alcohol 20c a gal. higher in each case.

| | Current Market | | 1935 Low | 1935 High | 1934 Low | 1934 High |
|---|---|---|---|---|---|---|
| Amyl Chloride, norm drs, wks lb. | .56 | .68 | .56 | .68 | .56 | .68 |
| Chloride, mixed, drs, | | | | | | |
| wks ...................lb. | .07 | .077 | .07 | .077 | .07 | 12.2 |
| tks, wks ............lb. | ... | .06 | ... | .06 | .06 | 10.5 |
| Mercaptan, drs, wks ....lb. | ... | 1.10 | ... | 1.10 | ... | 1.10 |
| Amylene, drs, wks .......lb. | .102 | .11 | .102 | .11 | .10 | .11 |
| tks, wks ................lb. | ... | .09 | ... | .09 | ... | .09 |
| Aniline Oil, 960 lb drs and tks lb. | .15 | .17½ | .15 | .17½ | .15 | .17½ |
| Annatto fine ............lb. | .34 | .37 | .34 | .37 | .34 | .37 |
| Anthracene, 80% ........lb. | ... | .75 | ... | .75 | ... | .75 |
| 40% ....................lb. | ... | .18 | ... | .18 | ... | .18 |
| Anthraquinone, sublimed, 125 | | | | | | |
| lb bbls ...............lb. | .50 | .52 | .50 | .52 | .45 | .50 |
| Antimony, metal slabs, ton | | | | | | |
| lots ...................lb. | .. | .14 | .12½ | .16 | .07 | .14½ |
| Needle, powd, bbls .....lb. | .12½ | .13½ | .09 | .13½ | .07 | .09 |
| Butter of, see Chloride. | | | | | | |
| Chloride, soln cbys .....lb. | .13 | .17 | .13 | .17 | .13 | .17 |
| Oxide, 500 lb bbls .....lb. | .13 | .13¾ | .10¼ | .13¾ | .08 | .11 |
| Salt, 63% to 65%, tins..lb. | .22 | .24 | .22 | .24 | .22 | .24 |
| Sulfuret, golden, bbls ...lb. | .22 | .23 | .19 | .23 | .16 | .23 |
| Vermilion, bbls ........lb. | .35 | .42 | .35 | .42 | .35 | .42 |
| Archil, conc, 600 lb bbls ..lb. | .21 | .27 | .21 | .27 | .21 | .27 |
| Double, 600 lb bbls .....lb. | .18 | .20 | .18 | .20 | .18 | .20 |
| Triple, 600 lb bbls .....lb. | .18 | .20 | .18 | .20 | .18 | .20 |
| Arglos, 80%, casks ......lb. | .15 | .16 | .15 | .16 | .15 | .16 |
| Crude, 30%, casks .....lb. | .07 | .08 | .07 | .08 | .07 | .09 |
| Aroclors, wks ............lb. | .18 | .30 | .18 | .30 | .18 | .30 |
| Arrowroot, bbl ............lb. | .08¾ | .09¼ | .08¾ | .09¼ | .08¾ | .09¼ |
| Arsenic, Red, 224 lb cs kgs lb. | ... | .15¾ | ... | .15¾ | .14 | .15¾ |
| White, 112 lb kgs ......lb. | .03½ | .04½ | .03½ | .04½ | .03½ | .05 |
| Metal ....................lb. | .40 | .42 | .40 | .42 | .40 | .45 |
| Asbestine, c-l wks .......ton | 13.00 | 15.00 | 13.00 | 15.00 | 13.00 | 15.00 |
| Barium Carbonate precip, | | | | | | |
| 200 lb bgs, wks ......ton | 56.50 | 61.00 | 56.50 | 61.00 | 56.50 | 61.00 |
| Nat (witherite) 90% gr, | | | | | | |
| c-l, wks, bgs ........ton | 42.00 | 45.00 | 42.00 | 45.00 | 42.00 | 45.00 |
| Chlorate, 112 lb kgs NY lb. | .15½ | .17¼ | .14 | .17½ | .14 | .16 |
| Chloride, 600 lb bbl wks ton | 72.00 | 74.00 | 72.00 | 74.00 | 72.00 | 74.00 |
| Dioxide, 88%, 690 lb drs lb. | .11 | .12 | .11 | .12 | .11 | .13 |
| Hydrate, 500 lb bbls ....lb. | .05½ | .06 | .05½ | .06 | .04¾ | .06 |
| Nitrate, 700 lb cks .....lb. | ... | .08¼ | ... | .08¼ | ... | .08¼ |
| Barytes, floated, 350 lb bbls | | | | | | |
| wks ...................ton | 23.65 | 31.15 | 23.00 | 31.15 | 23.00 | 30.50 |
| Bauxite, bulk, mines .....ton | 7.00 | 10.00 | 7.00 | 10.00 | 5.00 | 10.00 |
| Bentonite, c-l, No. 1, bgs, | | | | | | |
| wks ...................ton | ... | 16.50 | 16.50 | 18.00 | ... | ... |
| No. 2 ....................ton | ... | 11.00 | 11.00 | 12.50 | ... | ... |
| Benzaldehyde, tech, 945 lb | | | | | | |
| drs, wks ..............lb. | .60 | .62 | .60 | .62 | .60 | .65 |
| Benzene (Benzol), 90%, Ind, | | | | | | |
| 8000 gal tks, frt allowed | | | | | | |
| .........................gal. | ... | .18 | .15 | .18 | .15 | .20½ |
| 90% c-l, drs ...........gal. | ... | .23 | .23 | .24 | ... | .24 |
| Ind Pure, tks, frt allowed | | | | | | |
| .........................gal. | ... | .18 | .15 | .18 | .15 | .20½ |
| Benzidine Base, dry, 250 lb | | | | | | |
| bbls ....................lb. | .67 | .69 | .67 | .69 | .67 | .69 |
| Benzoyl Chloride, 500 lb drs lb. | .40 | .45 | .40 | .45 | .40 | .45 |
| Benzyl Chloride, tech, drs..lb. | .30 | .40 | .30 | .40 | .30 | .40 |
| Beta-Naphthol, 250 lb bbl, | | | | | | |
| wks ....................lb. | ... | .24 | ... | .24 | ... | .24 |
| Naphthylamine, sublimed, | | | | | | |
| 200 lb bbls ..........lb. | 1.25 | 1.35 | 1.25 | 1.35 | 1.25 | 1.35 |
| Tech, 200 lb bbls .......lb. | .53 | .55 | .53 | .55 | .53 | .58 |
| Bismuth metal ............ | 1.00 | 1.10 | .90 | 1.20 | 1.10 | 1.30 |
| Chloride, boxes ........lb. | 3.20 | 3.25 | 3.20 | 3.25 | ... | ... |
| Hydroxide, boxes ......lb. | 3.15 | 3.20 | 3.15 | 3.20 | ... | ... |
| Oxychloride, boxes .....lb. | 2.95 | 3.00 | 2.95 | 3.00 | ... | ... |
| Subbenzoate, boxes .....lb. | 3.25 | 3.30 | 3.25 | 3.30 | ... | ... |
| Subcarbonate, kgs ......lb. | 1.40 | 1.45 | 1.55 | 1.70 | ... | ... |
| Trioxide, powd, boxes ..lb. | 3.45 | 3.50 | 3.45 | 3.50 | ... | ... |
| Subnitrate ............... | 1.30 | 1.35 | 1.30 | 1.45 | 1.40 | 1.60 |
| Blackstrap, cane (see Molasses, Blackstrap). | | | | | | |
| Blanc Fixe, 400 lb bbls, | | | | | | |
| wks ..............ton h | 42.50 | 70.00 | 42.50 | 70.00 | 42.50 | 70.00 |
| Bleaching Powder, 800 lb drs | | | | | | |
| c-l wks contract...100 lb. | ... | 2.00 | 1.90 | 2.00 | ... | 1.90 |
| lcl, drs, wks ...........lb. | 2.25 | 3.60 | 2.15 | 3.60 | 2.00 | 3.50 |
| Blood, dried, f.o.b., NY..unit | ... | 3.00 | 2.50 | 3.25 | 2.40 | 3.25 |
| Chicago, high grade ...unit | ... | 3.00 | 2.50 | 3.75 | 2.00 | 3.10 |
| Imported shipt .......unit | 2.95 | 3.07½ | 2.75 | 3.30 | 2.75 | 3.20 |
| Blues, Bronze Chinese Milori | | | | | | |
| Prussian Soluble .....lb. | .36½ | .38 | .36½ | .38 | .35½ | .38 |
| Bone, 4½ + 50% raw, | | | | | | |
| Chicago ...............ton | 20.00 | 22.00 | 19.00 | 22.00 | 19.00 | 25.00 |
| Bone Ash, 100 lb kgs .....lb. | .06 | .07 | .06 | .07 | .06 | .07 |
| Black, 200 lb bbls .......lb. | .05½ | .08¼ | .05½ | .08¼ | .05½ | .08¼ |
| Meal, 3% & 50%, imp..ton | ... | 23.00 | 22.75 | 24.00 | 16.00 | 24.00 |
| Domestic, bgs, Chicago..ton | 19.00 | 20.00 | 16.00 | 21.00 | ... | ... |
| Borax, tech, gran, 80 ton lots, | | | | | | |
| sacks, delv ........ton i | ... | 40.00 | 36.00 | 40.00 | 36.00 | 36.00 |
| bbls, delv ...........ton i | ... | 50.00 | 46.00 | 50.00 | 46.00 | 46.00 |
| c-l, sacks, delv .......ton i | ... | 44.00 | 40.00 | 44.00 | 40.00 | 40.00 |
| c-l, bbls, delv .........ton i | ... | 54.00 | 50.00 | 54.00 | 50.00 | 50.00 |
| Tech, powd, 80 ton lots, | | | | | | |
| sacks ...............ton i | ... | 45.00 | 41.00 | 45.00 | 41.00 | 41.00 |
| bbls, delv ............ton i | ... | 56.00 | 51.00 | 56.00 | 51.00 | 51.00 |
| c-l, sacks, delv .......ton i | ... | 49.00 | 45.00 | 49.00 | 45.00 | 45.00 |
| c-l, bbls, delv .........ton i | ... | 59.00 | 55.00 | 59.00 | 55.00 | 55.00 |
| Bordeaux Mixture, jobbers, | | | | | | |
| East, c-l, tins, drs, cases lb. | .08 | .16 | .08 | .16 | ... | .16 |
| Jobbers, West, c-l ......lb. | .08 | .10 | .08 | .10 | ... | .10 |
| Dealers, East, c-l .......lb. | .08½ | .16½ | .08½ | .16½ | ... | .16½ |
| Dealers, West, c-l ......lb. | .09 | .11 | .09 | .11 | ... | .11 |

h Lowest price is for pulp, highest for high grade precipitated; i Crystals $6 per ton higher; USP, $15 higher in each case.

## *Prices*

| | Current Market | | 1935 Low | 1935 High | 1934 Low | 1934 High |
|---|---|---|---|---|---|---|
| Bromine, cases ..........lb. | .30 | .43 | .30 | .43 | .30 | .43 |
| Bronze, Al, pwd, 300 lb drs lb. | .80 | 1.50 | .80 | 1.50 | .80 | 1.50 |
| Gold, blk ..............lb. | .40 | .55 | .40 | .55 | .40 | .55 |
| Butanes, com 16-32° group 3 tks ..................lb. | ... | .04 | ... | .04 | .02¾ | .04 |
| Butyl, Acetate, norm drs, frt allowed ............lb. | .12 | .12½ | .12 | .13½ | .11 | .14 |
| tks, frt allowed .......lb. | ... | .11 | .11 | .13 | .10 | .13 |
| Secondary tks, frt allowed lb. | .. | .096 | ... | .096 | .08 | .096 |
| drs, frt, allowed ......lb. | .106 | .111 | .106 | .111 | ... | .111 |
| Aldehyde, 50 gal drs wks lbs. | .19 | .21 | .19 | .21 | .19 | .36 |
| Secondary, drs ........lb. | .60 | .75 | .60 | .75 | .60 | .75 |
| Carbinol, norm drs, wks lb. | .60 | .75 | .60 | .75 | .60 | .75 |
| Lactate drs ............lb. | .22½ | .23½ | .22½ | .23½ | .22½ | .29 |
| Propionate, drs ........lb. | .18 | .18½ | .18 | .18½ | .17 | .22 |
| tks, delv ...........lb. | ... | .17 | ... | .17 | ... | .17 |
| Stearate, 50 gal drs ....lb. | ... | .26 | ... | .26 | .25 | .26 |
| Tartrate, drs ..........lb. | .55 | .60 | .55 | .60 | .55 | .60 |
| Cadmium, Sulfide, boxes...lb. | ... | .90 | .75 | .85 | .65 | .85 |
| Cadmium Metal .........lb. | .85 | .90 | .55 | .90 | .55 | .65 |
| Calcium, Acetate, 150 lb bgs c-l, delv ..........100 lb. | ... | 2.10 | 2.00 | 2.10 | 2.00 | 3.00 |
| Arsenate, jobbers, East of Rocky Mts, drs ......lb. | .06 | .06⅜ | .06 | .06½ | ... | ... |
| dealers, drs .........lb. | .06¼ | .07¾ | .06¼ | .07¾ | ... | ... |
| South, jobbers, drs .....lb. | .06 | .06½ | .06 | .06½ | ... | ... |
| dealers, drs .........lb. | .06½ | .06¾ | .06¼ | .06¾ | ... | ... |
| Carbide, drs ...........lb. | .05 | .06 | .05 | .06 | .05 | .06 |
| Carbonate, tech, 100 lb bgs c-l ..................lb. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Chloride, flake, 375 lb drs c-l wks .............ton | ... | 19.50 | ... | 19.50 | ... | 19.50 |
| Solid, 650 lb drs c-l f.o.b. wks ................ton | ... | 17.50 | ... | 17.50 | ... | 17.50 |
| Ferrocyanide, 350 lb bbls wks ................lb. | ... | .17 | ... | .17 | ... | .17 |
| Gluconate, tech, 125 lb bbls .................lb. | ... | .28 | ... | .28 | .25 | .28 |
| Nitrate, 100 lb bgs .......ton | ... | 26.50 | ... | 26.50 | ... | 26.50 |
| Palmitate, bbls .........lb. | .21 | .22 | .20 | .22 | .19 | .20 |
| Peroxide, 100 lb drs ....lb. | ... | 1.25 | ... | 1.25 | ... | 1.25 |
| Phosphate, tech, 450 lb bbls ................lb. | .07½ | .08 | .07½ | .08 | .07½ | .08 |
| Resinate, precip, bbls ...lb. | .13 | .14 | .13 | .14 | .13 | .14 |
| Stearate, 100 lb bbls....lb. | .18 | .20 | .17 | .20 | .17 | .19 |
| Camphor, slabs ..........lb. | .56 | .57 | .49 | .57 | .51 | .59 |
| Powder ...............lb. | .56 | .57 | .50 | .57 | .51 | .59 |
| Camwood, Bk, ground bbls lb. | .16 | .18 | .16 | .18 | .16 | .18 |
| Carbon, Decolorizing, drs c-l ...................lb. | .08 | .15 | .08 | .15 | .08 | .15 |
| Black, c-l, bgs, delv, price varying with zone ....lb. | .0445 | .0535 | .0445 | .0535 | .0445 | .0535 |
| lcl, bgs, delv, all zones lb. | ... | .07 | ... | .07 | .06½ | .07 |
| cartons, delv .......lb. | ... | .07¾ | ... | .07¾ | ... | .07¾ |
| cases, delv ........lb. | ... | .08¼ | ... | .08¼ | ... | .08¼ |
| Bisulfide, 500 lb drs....lb. | .05¼ | .08 | .05¼ | .08 | .05½ | .08 |
| Dioxide, Liq 20-25 lb cyl lb. | .06 | .08 | .06 | .08 | .06 | .08 |
| Tetrachloride, 1400 lb drs, delv .................lb. | .05¼ | .06 | .05¼ | .06 | .05¼ | .06 |
| Casein, Standard, Dom grd lb. | .14½ | .15¾ | .09½ | .15¾ | .09¼ | .13 |
| 80-100 mesh, c-l, bgs ....lb. | .15 | .16¼ | .10 | .16¼ | .10 | .14 |
| Castor Pomace, 5½ $NH_3$, cl, bgs, wks ...........ton | ... | 16.50 | 16.50 | 18.50 | ... | ... |
| Imported, ship, bgs ....ton | ... | 17.50 | 17.25 | 20.00 | ... | ... |
| Celluloid, Scraps, ivory cs lb. | .17 | .18 | .17 | .18 | .13 | .18 |
| Transparent, cs ........lb. | ... | .20 | ... | .20 | .16 | .20 |
| Cellulose, Acetate, 50 lb kgs ......................lb. | .55 | .60 | .55 | .60 | .55 | .90 |
| Chalk, dropped, 175 lb bbls lb. | .03 | .03¾ | .03 | .03¾ | .03 | .03¾ |
| Precip, heavy, 560 lb cks lb. | .03 | .04 | .03 | .04 | .03 | .04 |
| Light, 250 lb cks .......lb. | .03 | .04 | .03 | .04 | .03 | .04 |
| Charcoal, Hardwood, lump, blk, wks ............bu. | ... | .15 | ... | .15 | .12 | .18 |
| Willow, powd, 100 lb bbl wks ................lb. | .06 | .06¼ | .06 | .06¼ | .06 | .06¼ |
| bgs, delv* ..........ton | 24.40 | 25.40 | 22.40 | 30.00 | ... | ... |
| Chestnut, clarified bbls wks lb. | ... | .01⅞ | ... | .01⅞ | .01⅝ | .01⅞ |
| 25% tks wks ..........lb. | ... | .01½ | ... | .01½ | .01¼ | .01½ |
| Pwd, 60%, 100 lb bgs, wks ..................lb. | .. | .04⅞ | ... | .04⅞ | ... | .04⅞ |
| China Clay, c-l, blk mines ton | ... | 7.00 | ... | 7.00 | 7.00 | 9.00 |
| Powdered, bbls ........lb. | .01 | .02 | .01 | .02 | .01 | .02 |
| Pulverized, bbls wks ...ton | 10.00 | 12.00 | 10.00 | 12.00 | 10.00 | 12.00 |
| Imported, lump, blk ...ton | 15.00 | 25.00 | 15.00 | 25.00 | 15.00 | 25.00 |
| Chlorine, cyls, lcl, wks contract ................lb. | .07½ | .08½ | .07½ | .08½ | .07 | .08½ |
| cyls, c-l, contract ...lb. *j* | ... | .05½ | .. | .05½ | ... | .05½ |
| Liq tk wks contract..100 lb. | ... | 2.15 | 2.00 | 2.15 | 1.85 | 2.00 |
| Multi c-l cyls wks cont..lb. | 2.30 | 2.55 | 2.30 | 2.40 | 2.00 | 2.40 |
| Chloroacetophenone, tins, wks ......................lb. | ... | 2.00 | ... | 2.00 | ... | ... |
| Chlorobenzene, Mono, 100 lb drs, lc-l, wks ........lb. | .06 | .07½ | .06 | .07½ | .06 | .07½ |
| Chloroform, tech, 1000 lb drs ......................lb. | .20 | .21 | .20 | .21 | .20 | .21 |
| USP, 25 lb tins ........lb. | .30 | .31 | .30 | .31 | .30 | .35 |
| Chloropicrin; comml cyls..lb. | .85 | .90 | .85 | .90 | .85 | 1.25 |
| Chrome, Green, CP ......lb. | .17 | .18½ | .17 | .30 | .20 | .30 |
| Yellow ...............lb. | .13 | .15 | .13 | .16 | .15 | .16 |
| Chromium, Acetate, 8% Chrome bbls .........lb. | .05 | .05¾ | .05 | .05¾ | .05 | .05¾ |
| 20° soln, 400 lb bbls ...lb. | ... | .05½ | ... | .05½ | ... | .05½ |
| Fluoride, powd, 400 lb bbl ......................lb. | .27 | .28 | .27 | .28 | .27 | .28 |

*j* A delivered price; * Depends upon point of delivery.

## *Current*

**Coal Tar**
**Diphenylguanidine**

| | Current Market | | 1935 Low | 1935 High | 1934 Low | 1934 High |
|---|---|---|---|---|---|---|
| Coal tar, bbls ...........bbl. | 7.25 | 9.00 | 7.25 | 9.00 | 7.25 | 9.00 |
| Cobalt Acetate, bbls ......lb. | ... | .60 | ... | .60 | .60 | .80 |
| Carbonate tech, bbls ....lb. | 1.35 | 1.40 | 1.35 | 1.40 | 1.34 | 1.40 |
| Hydrate, bbls .........lb. | 1.66 | 1.76 | 1.66 | 1.76 | 1.66 | 1.76 |
| Linoleate, paste, bbls ...lb. | ... | .30 | ... | .30 | .30 | .40 |
| Resinate, fused, bbls ...lb. | ... | .12½ | ... | .12½ | ... | .12½ |
| Precipitated, bbls ......lb. | ... | .32 | ... | .32 | .32 | .42 |
| Cobalt Oxide, black, bgs ..lb. | 1.39 | 1.49 | 1.25 | 1.49 | 1.25 | 1.35 |
| Cochineal, gray or bk bgs lb. | .32 | .36 | .32 | .39 | .33 | .42 |
| Teneriffe silver, bgs ....lb. | .33 | .37 | .33 | .40 | .34 | .43 |
| Copper, metal, electrol 100 lb. | ... | 9.25 | 8.00 | 9.25 | 7.87½ | 9.00 |
| Carbonate, 400 lb bbls ..lb. | ... | .08¼ | ... | .08¼ | ... | .08¼ |
| 52-54% bbls ........lb. | .14½ | .16¼ | .14½ | .16¼ | .15½ | .16 |
| Chloride, 250 lb bbls ...lb. | .17 | .18 | .17 | .18 | .17 | .18 |
| Cyanide, 100 lb drs ....lb. | .37 | .38 | .37 | .38 | .37 | .40 |
| Oleate, precip, bbls .....lb. | ... | .20 | ... | .20 | ... | .20 |
| Oxide, red, 100 lb bbls ..lb. | .15 | .17 | .15 | .17 | .12½ | .17 |
| black bbls, wks ......lb. | .14½ | .15 | .14 | .16½ | ... | ... |
| Resinate, precip, bbls ...lb. | .18 | .19 | .18 | .19 | .18 | .19 |
| Stearate, precip, bbls ...lb. | .35 | .40 | .35 | .40 | .35 | .40 |
| Sub-acetate verdigris, 400 lb bbls ..............lb. | .18 | .19 | .18 | .19 | .18 | .19 |
| Sulfate, bbls, c-l, wks 100 lb. | ... | 3.85 | ... | 3.85 | 3.75 | 3.85 |
| Copperas, crys and sugar bulk c-l, wks, bgs ........ton | 12.00 | 13.00 | 12.00 | 13.00 | 12.00 | 14.50 |
| Corn Syrup, 42 deg, bbls .................100 lb. | ... | 3.63 | 3.49 | 3.63 | 3.04 | 3.59 |
| 43 deg, bbls ......100 lb. | ... | 3.68 | 3.54 | 3.68 | 3.09 | 3.64 |
| Corn Sugar, tanners, bbls ............100 lbs. | ... | 3.56 | 3.46 | 3.66 | ... | ... |
| Cotton, Soluble, wet, 100 lb bbls ................lb. | .40 | .42 | .40 | .42 | .40 | .42 |
| Cream Tartar, USP, powd & gran, 300 lb bbls .....lb. | ... | .16¾ | .16¼ | .17¼ | .17½ | .19½ |
| Creosote, USP, 42 lb cbys lb. | .45 | .47 | .45 | .47 | .45 | .47 |
| Oil, Grade 1, tks ......gal. | .12 | .13 | .11½ | .13 | .10 | .12½ |
| Grade 2 ...........gal. | .109 | .12 | .10½ | .12 | .10½ | .12 |
| Cresol, USP, drs ........lb. | .11 | .11½ | .11 | .11½ | .11 | .11½ |
| Crotonaldehyde, 98% 50 gal drs ................lb. | .32 | .36 | .32 | .36 | .26 | .36 |
| Cudbear, English ........lb. | .19 | .25 | .19 | .25 | .19 | .25 |
| Philippine, 100 lb bale ..lb. | .03¾ | .04¾ | .03½ | .04¾ | .03½ | .04¾ |
| Cyanamid, bags c-l frt allowed Ammonia unit ......... | ... | 1.07½ | ... | 1.07½ | ... | 1.07½ |
| Dextrin, corn, 140 lb bgs f.o.b., Chicago ...100 lb. | 3.95 | 4.05 | 3.95 | 4.15 | 3.50 | 4.20 |
| British Gum, bgs ...100 lb. | 4.15 | 4.45 | 4.15 | 4.50 | 3.75 | 4.60 |
| White, 140 lb bgs ..100 lb. | 4.00 | 4.10 | 3.90 | 4.10 | 3.47 | 4.20 |
| Potato, Yellow, 220 lb bgs ...............lb. | .07¾ | .08¾ | .07¾ | .08¾ | .07¾ | .08¾ |
| White, 220 lb bgs, lcl ...lb. | .08 | .09 | .08 | .09 | .08 | .09 |
| Tapioca, 200 bgs, lcl ....lb. | ... | .08 | .08 | .08¾ | .06¾ | .08¾ |
| Diamylamine, drs, wks ....lb. | ... | 1.00 | ... | 1.00 | ... | 1.00 |
| Diamylene, drs, wks ......lb. | .095 | .102 | .095 | .102 | .09 | .102 |
| tks, wks ..............lb. | ... | .08½ | ... | .08½ | ... | .08½ |
| Diamylether, wks, drs ....lb. | .085 | .092 | .085 | .092 | .09 | .77 |
| tks, wks ..............lb. | ... | .075 | ... | .075 | ... | ... |
| Diamylphthalate, drs wks gal. | .18 | .19½ | .18 | .20½ | ... | .20½ |
| Diamyl Sulfide, drs, wks lb. | ... | 1.10 | ... | 1.10 | ... | 1.10 |
| Dianisidine, bbls .........lb. | 2.25 | 2.45 | 2.25 | 2.45 | 2.35 | 2.45 |
| Dibutylphthalate, drs, wks lb. | .20 | .21 | .20 | .23 | .20½ | .21 |
| Dibutyltartrate, 50 gal drs lb. | .35 | .40 | .35 | .40 | .35 | .40 |
| Dichlorethylene, drs .....gal. | .29 | ... | .29 | ... | .29 | ... |
| Dichloroethylether, 50 gal drs, wks ................lb. | .16 | .17 | .16 | .17 | .16 | .21 |
| tks, wks ..............lb. | ... | .15 | ... | .15 | ... | .15 |
| Dichloromethane, drs, wks lb. | ... | .23 | .15 | .23 | ... | .15 |
| Dichloropentanes, drs, wks lb. | .032 | .040 | .032 | .040 | .0278 | .040 |
| tks, wks ..............lb. | ... | .02½ | ... | .02½ | ... | .02½ |
| Diethanolamine, tks ......lb. | ... | .30 | ... | ... | ... | ... |
| Diethylamine, 400 lb drs ..lb. | 2.75 | 3.00 | 2.75 | 3.00 | 2.75 | 3.00 |
| Diethyl Carbinol, drs .....lb. | .60 | .75 | .60 | .75 | .60 | .75 |
| Diethylcarbonate, com drs lb. | .31⅜ | .35 | .31⅜ | .35 | .31⅜ | .35 |
| 90% grade, drs ......lb. | ... | .25 | ... | .25 | ... | .25 |
| Diethylaniline, 850 lb drs..lb. | .52 | .55 | .52 | .55 | .52 | .55 |
| Diethylorthotoluidin, drs ..lb. | .64 | .67 | .64 | .67 | .64 | .67 |
| Diethyl phthalate, 1000 lb drs ................lb. | .18½ | .19 | .18½ | .27 | .26 | .27 |
| Diethylsulfate, tech, 50 gal drs ................lb. | ... | ... | ... | ... | ... | ... |
| Diethyleneglycol, drs .....lb. | .15½ | .17½ | .15½ | .17½ | .14 | .16 |
| Mono ethyl ethers, drs..lb. | .15 | .17 | .15 | .17 | .15 | .17 |
| tks, wks ............lb. | ... | .15 | ... | .15 | ... | ... |
| Mono butyl ether, drs ..lb. | ... | .26 | ... | .26 | ... | .26 |
| Diethylene oxide, 50 gal drs wks ..................lb. | .20 | .24 | .20 | .27 | .26 | .27 |
| Diglycol Oleate, bbls .....lb. | .16 | .24 | .16 | .24 | .16 | .18 |
| Dimethylamine, 400 lb drs, pure 25 & 40% sol 100% basis ..............lb. | ... | .95 | ... | .95 | .95 | 1.20 |
| Dimethylaniline, 340 lb drs lb. | .29 | .30 | .29 | .30 | .29 | .30 |
| Dimethyl Ethyl Carbinol, drs ....................lb. | .60 | .75 | .60 | .75 | .60 | .75 |
| Dimethyl phthalate, drs ...lb. | .20 | .21½ | .20½ | .24½ | .24 | .24½ |
| Dimethysulfate, 100 lb drs lb. | .45 | .50 | .45 | .50 | .45 | .50 |
| Dinitrobenzene, 400 lb bbls ...................lb. *k* | .17 | .19½ | .17 | .19½ | .17 | .19½ |
| Dintrochlorobenzene, 400 lb bbls ...............lb. | .14 | .15½ | .14 | .15½ | .14 | .15½ |
| Dinitronaphthalene, 350 lb bbls ................lb. | .34 | .37 | .34 | .37 | .34 | .37 |
| Dinitrophenol, 350 lb bbls lb. | .23 | .24 | .23 | .24 | .23 | .24 |
| Dinitrotoluene, 300 lb bbls lb. | .15½ | .16½ | .15½ | .16½ | .15½ | .16½ |
| Diphenyl ..............lb. | .15 | .25 | .15 | .25 | .15 | .25 |
| Diphenylamine ..........lb. | .31 | .32 | .31 | .32 | .31 | .34 |
| Diphenylguanidine, 100 lb bbl ....................lb. | .36 | .37 | .36 | .37 | .36 | .37 |

*k* Higher price is for purified material.

## Prices

| | Current Market | | 1935 Low | 1935 High | 1934 Low | 1934 High |
|---|---|---|---|---|---|---|
| Dip Oil, see Tar Acid Oil. | | | | | | |
| Divi Divi pods, bgs shipmt. ton | 36.00 | 40.00 | 36.00 | 40.00 | 35.00 | 40.00 |
| Extract ..... lb. | .05 | .05½ | .05 | .05½ | .05 | .05½ |
| Egg Yolk, dom., 200 lb cases ..... lb. | ... | .63 | .46 | .63 | .40 | .54 |
| Imported ..... lb. | .56 | .58 | ... | ... | ... | ... |
| Epsom Salt, tech, 300 lb bbls c-l NY ..... 100 lb. | 1.80 | 2.00 | 1.80 | 2.25 | 2.20 | 2.25 |
| USP, c-l, bbls ..... 100 lb. | ... | 2.00 | 2.00 | 2.25 | 2.25 | 2.25 |
| Ether, USP anaesthesia 55 lb drs ..... lb. | .22 | .23 | .22 | .23 | .22 | .24 |
| (Conc) ..... lb. | .09 | .10 | .09 | .10 | .09 | .10 |
| Ether, Isopropyl 50 gal drs lb. | .07 | .08 | .07 | .08 | .07 | .08 |
| tks, frt allowed ..... lb. | ... | .06 | ... | .06 | ... | ... |
| Nitrous, conc, bottles ... lb. | .75 | .77 | .75 | .77 | .75 | .77 |
| Synthetic, wks, drs ..... lb. | .08 | .09 | .08 | .09 | .08 | .09 |
| Ethyl Acetate, 85% Ester tks ..... lb. | .07½ | .08 | .07½ | .08 | .07½ | .08 |
| drs ..... lb. | .08½ | .09 | .08½ | .09 | .08½ | .09 |
| Anhydrous, tks ..... lb. | ... | .08½ | ... | .08½ | .08½ | .10 |
| drs ..... lb. | .09½ | .10 | .09½ | .10 | .09½ | .10¼ |
| Acetoacetate, 50 gal drs lb. | .65 | .68 | .65 | .68 | .65 | .68 |
| Benzylaniline, 300 lb drs lb. | .88 | .90 | .88 | .90 | .88 | .90 |
| Bromide, tech, drs ..... lb. | .50 | .55 | .50 | .55 | .50 | .55 |
| Chloride, 200 lb drs ..... lb. | .22 | .24 | .22 | .24 | .22 | .24 |
| Chlorocarbonate cbys ... lb. | ... | .30 | ... | .30 | ... | .30 |
| Crotonate, drs ..... lb. | 1.00 | 1.25 | 1.00 | 1.25 | 1.00 | 1.25 |
| Ether, Absolute, 50 gal drs ..... lb. | .50 | .52 | .50 | .52 | .50 | .52 |
| Lactate, drs, wks ..... lb. | .25 | .29 | .25 | .29 | .25 | .33 |
| Methyl Ketone, 50 gal drs, frt allowed ..... lb. | .08½ | .09 | .08½ | .09 | .08½ | .09 |
| tks, frt allowed ..... lb. | ... | .07½ | ... | .07½ | ... | ... |
| Oxalate, drs, wks ..... lb. | .37½ | .55 | .37½ | .55 | .37½ | .55 |
| Oxybutyrate, 50 gal drs wks ..... lb. | .30 | .30½ | .30 | .30½ | .30 | .30½ |
| Ethylene Dibromide, 60 lb drs ..... lb. | .65 | .70 | .65 | .70 | .65 | .70 |
| Chlorhydrin, 40%, 10 gal cbys chloro, cont ..... lb. | .75 | .85 | .75 | .85 | .75 | .85 |
| Anhydrous ..... lb. | ... | .75 | ... | ... | ... | ... |
| Dichloride, 50 gal drs .. lb. | .0545 | .0994 | .0545 | .0994 | .0545 | .09 |
| Glycol, 50 gal drs, wks lb. | .17 | .21 | .17 | .28 | .26 | .28 |
| tks, wks ..... lb. | ... | .16 | ... | ... | ... | ... |
| Mono Butyl Ether, drs, wks ..... | .20 | .21 | .20 | .21 | .20 | .21 |
| tks, wks ..... lb. | ... | .19 | ... | .19 | .19 | .19 |
| Mono Ethyl Ether, drs, wks ..... | .16 | .17 | .16 | .17 | .15 | .17 |
| tks, wks ..... lb | ... | .15 | ... | .15 | .15 | .15 |
| Mono Ethyl Ether Acetate, drs, wks ..... | .17½ | .18½ | .17½ | .18½ | .16½ | .18½ |
| tks, wks ..... lb. | ... | .16½ | ... | .16½ | .16½ | .16½ |
| Mono, Methyl Ether, drs wks ..... lb. | .19 | .23 | .19 | .23 | .21 | .23 |
| tks, wks ..... lb. | ... | .18 | ... | ... | ... | ... |
| Stearate ..... | .18 | .18 | .18 | .18 | .18 | .18 |
| Oxide, cyl ..... lb. | .55 | .60 | .55 | .75 | ... | .75 |
| Ethylidenaniline ..... lb. | .45 | .47½ | .45 | .47½ | .45 | .47½ |
| Feldspar, blk pottery ..... ton | ... | 14.50 | ... | 14.50 | ... | 14.50 |
| Powd, blk, wks ..... ton | 14.00 | 14.50 | 14.00 | 14.50 | 13.50 | 14.50 |
| Ferric Chloride, tech, crys, 475 lb bbls ..... lb. | .05 | .07½ | .05 | .07½ | .05 | .07½ |
| sol, 42° cbys ..... lb. | .06¼ | .06½ | .06¼ | .06½ | ... | ... |
| Fish Scrap, dried, unground, wks ..... unit *l* | ... | nom. | 2.25 | 2.90 | 2.25 | 2.60 |
| Acid, Bulk, 6 & 3%, delv Norfolk & Baltimore basis ..... unit *m* | ... | nom. | 2.00 | 2.35 | 2.00 | 2.50 |
| Fluorspar, 98%, bgs ..... | 30.00 | 35.50 | 28.00 | 35.50 | 28.00 | 35.50 |
| Formaldehyde, USP, 400 lb bbls, wks ..... lb. | .06 | .07 | .06 | .07 | .06 | .07 |
| Fossil Flour ..... lb. | .02½ | .04 | .02½ | .04 | .02½ | .04 |
| Fullers Earth, blk, mines ..... ton | 6.50 | 15.00 | 6.50 | 15.00 | 6.50 | 15.00 |
| Imp powd, c-l, bgs ..... ton | 23.00 | 30.00 | 23.00 | 30.00 | 23.00 | 30.00 |
| Furfural (tech) drs, wks lb. | .10 | .15 | .10 | .15 | .10 | .15 |
| Furfuramide (tech) 100 lb drs ..... lb. | ... | .30 | ... | .30 | ... | .30 |
| Fusel Oil, 10% impurities lb. | .16 | .18 | .16 | .18 | .16 | .18 |
| Fustic, chips ..... lb. | .04 | .05 | .04 | .05 | .04 | .05 |
| Crystals, 100 lb boxes .. lb. | .20 | .23 | .20 | .23 | .20 | .23 |
| Liquid 50°, 600 lb bbls .. lb. | .08½ | .12 | .08½ | .12 | .08½ | .12 |
| Solid, 50 lb boxes ..... lb. | .16 | .18 | .16 | .18 | .16 | .18 |
| Sticks ..... ton | 25.00 | 26.00 | 25.00 | 26.00 | 25.00 | 26.00 |
| G Salt paste, 360 lb bbls .. lb. | .42 | .43 | .42 | .43 | .42 | .43 |
| Gall Extract ..... lb. | .18 | .20 | .18 | .20 | .18 | .20 |
| Gambier, com 200 lb bgs .. lb. | ... | .06 | .05 | .08 | .04 | .08 |
| Singapore cubes, 150 lb bgs ..... 100 lb. | .08 | .09 | .07⅛ | .09⅛ | .05 | .09⅛ |
| Gelatin, tech, 100 lb cs ... lb. | .50 | .55 | .50 | .55 | .45 | .55 |
| Glauber's Salt, tech, c-l wks ..... 100 lb. | 1.10 | 1.30 | 1.10 | 1.30 | 1.10 | 1.30 |
| Anhydrous, see Sodium Sulfate. | | | | | | |
| Glucose (grape sugar) dry 70-80° bgs, c-l, NY .. 100 lb. | 3.24 | 3.34 | 3.24 | 3.34 | 3.24 | 3.34 |
| Tanner's Special, 100 lb. bgs ..... 100 lb. | ... | 2.33 | .. | 2.33 | ... | 2.33 |
| Glue, bone, com grades, c-l bgs ..... lb. | .10½ | .17½ | ... | ... | ... | ... |
| Better grades, c-l, bgs lb. | .12 | .17½ | ... | ... | ... | ... |
| Casein, kgs ..... lb. | .18 | .22 | .18 | .22 | .18 | .22 |
| Glycerin, CP, 550 lb drs .. lb. | .14 | .14½ | .14 | .14½ | .11 | .14½ |
| Dynamite, 100 lb drs ... lb. | .13¾ | .14¼ | .13¾ | .14¼ | .10 | .14¼ |
| Saponification, drs ..... lb. | .10¼ | .11½ | .10 | .11½ | .06¾ | .10½ |
| Soap Lye, drs ..... lb. | .09¼ | .09½ | .09 | .10 | .06¼ | .09½ |

*l* + 10; *m* + 50.

| | Current Market | | 1935 Low | 1935 High | 1934 Low | 1934 High |
|---|---|---|---|---|---|---|
| Glyceryl Phthalate ....... lb. | ... | .28 | ... | .28 | ... | .28 |
| Glyceryl Stearate, bbls.... lb. | ... | .18 | ... | .18 | ... | .18 |
| Glycol Phthallate ........ lb. | ... | .29 | .28 | .29 | ... | .28 |
| Glycol Stearate .......... lb. | ... | .23 | .18 | .23 | .18 | .20 |
| Graphite, | | | | | | |
| Crystalline, 500 lb bbls ........ lb. | .04 | .05 | .04 | .05 | .04 | .05 |
| Flake, 500 lb. bbls ..... lb. | .08 | .16 | .08 | .16 | .08 | .16 |
| Amorphous, bbls ......... lb. | .03 | .04 | .03 | .04 | .03 | .04 |

**GUMS**

| | Current Market | | 1935 Low | 1935 High | 1934 Low | 1934 High |
|---|---|---|---|---|---|---|
| Gum Aloes, Barbadoes .... lb. | .85 | .90 | .85 | .90 | .85 | .90 |
| Arabic, amber sorts ...... lb. | .12 | .14 | .09½ | .15 | .07¾ | .10⅝ |
| White sorts, No. 1, bgs ........ lb. | .25 | .27 | .21 | .27 | ... | ... |
| No. 2, bgs .......... lb. | .24 | .26 | .19 | .26 | ... | ... |
| Powd, bbls ........... lb. | .17 | .18 | .13½ | .18 | ... | ... |
| Asphaltum, Barbadoes (Manjak) 200 lb bgs, f.o.b., NY ........ lb. | .02½ | .10½ | .02½ | .10½ | .02½ | .10½ |
| Egyptian, 200 lb cases, f.o.b. NY ........ lb. | .12 | .15 | .12 | .15 | .12 | .15 |
| California, f.o.b. NY, drs ........ ton | 29.00 | 55.00 | 29.00 | 55.00 | ... | ... |
| Benzoin Sumatra, USP, 120 lb cases ........ lb. | ... | .19 | .19 | .28 | .18½ | .23 |
| Copal Congo, 112 lb bgs, clean, opaque ........ lb. | .19½ | .20 | .19½ | .24⅝ | .24⅛ | .28 |
| Dark, amber .......... lb. | .07¼ | .07¾ | .07¼ | .09¼ | .08⅝ | .10½ |
| Light, amber .......... lb. | .11¾ | .12¼ | .11½ | .14⅞ | .14⅜ | .19 |
| Copal, East India 180 lb bgs | | | | | | |
| Macassar pale bold .... lb. | .10 | .10⅛ | .09½ | .10¾ | .09⅞ | .10½ |
| Chips ............... lb. | .05½ | .06 | .05½ | .06 | ... | ... |
| Nubs ............... lb. | .08½ | .09 | .08½ | .09 | ... | ... |
| Dust ............... lb. | .03⅞ | .04⅜ | .03¾ | .04½ | ... | ... |
| Singapore | | | | | | |
| Bold ............... lb. | .12⅛ | .12⅝ | .12⅛ | .17 | .16 | .17 |
| Chips ............... lb. | .05½ | .05⅝ | .04⅝ | .05⅝ | ... | ... |
| Nubs ............... lb. | .11 | .11¾ | .10 | .11¾ | ... | ... |
| Dust ............... lb. | .03⅞ | .04⅜ | .03¾ | .05½ | ... | ... |
| Copal Manilla, 180-190 lb baskets, Loba A ..... lb. | .12½ | .13 | .11¾ | .13 | .11⅜ | .14½ |
| Loba B ............... lb. | .11⅛ | .12 | .10¼ | .12 | .10¼ | .13½ |
| Loba C ............... lb. | .10⅝ | .11⅛ | .10⅛ | .11½ | .09¾ | .12 |
| MA sorts ............. lb. | .06⅝ | .07⅛ | .06 | .07½ | .06½ | .07½ |
| DBB ............... lb. | .08⅞ | .09 | .08 | .09 | .08 | .09½ |
| Dust ............... lb. | .05¼ | .05⅜ | .04⅞ | .05⅜ | ... | ... |
| Copal Pontianak, 224 lb cases, bold genuine ........ lb. | .16⅛ | .16⅝ | .14⅜ | .16⅝ | .16⅛ | .19 |
| Mixed ............... lb. | .14⅜ | .14⅞ | .12⅞ | .14⅞ | ... | ... |
| Chips ............... lb. | .07¾ | .08¼ | .06⅞ | .08¼ | ... | ... |
| Nubs ............... lb. | .11¼ | .11¾ | .09⅝ | .11¾ | ... | ... |
| Split ............... lb. | .13 | .13½ | .12⅜ | .13½ | ... | ... |
| Dammar Batavia, 136 lb cases | | | | | | |
| A ............... lb. | .21⅜ | .21⅞ | .19 | .21⅞ | ... | ... |
| B ............... lb. | .20⅜ | .20⅞ | .18 | .20⅞ | ... | ... |
| C ............... lb. | .16½ | .17 | .16 | .17 | ... | ... |
| D ............... lb. | .13 | .13½ | .11¾ | .13⅞ | ... | ... |
| A/D ............... lb. | .15½ | .16 | .14 | .16 | ... | ... |
| A/E ............... lb. | .13 | .13¾ | .11¾ | .13¾ | ... | ... |
| E ............... lb. | .06¾ | .07¼ | .07 | .07¼ | .07 | .09½ |
| F ............... lb. | .06⅜ | .06⅞ | .06⅛ | .06⅞ | .05½ | .06⅝ |
| Singapore | | | | | | |
| No. 1 ............... lb. | .18½ | .19 | .15⅝ | .19 | .15½ | .18 |
| No. 2 ............... lb. | .14⅜ | .14⅞ | .10⅝ | .14⅞ | .09⅜ | .11 |
| No. 3 ............... lb. | .05¼ | .05¾ | .04⅝ | .05⅞ | .05⅛ | .07 |
| Chips ............... lb. | .09¾ | .09¾ | .08⅞ | .09¾ | .09 | .10¼ |
| Dust ............... lb. | .05½ | .05⅞ | .04¾ | .05⅞ | .05 | .06 |
| Seeds ............... lb. | .06⅝ | .06¾ | .04¾ | .07¼ | .06 | .07¾ |
| Ester ............... lb. | .07⅝ | .08⅜ | .07¼ | .08⅜ | ... | ... |
| Elemi, cons ............ lb. | .09¾ | .10¼ | ... | ... | ... | ... |
| Gamboge, pipe, cases ..... lb. | .55 | .56 | .55 | .65 | .57 | .65 |
| Powdered, bbls ........ lb. | .62 | .70 | .65 | .75 | .67 | .75 |
| Ghatti, sol. bgs ........ lb. | .11 | .15 | .09 | .15 | .09 | .09½ |
| Karaya, pow bbls xxx .... lb. | .24 | .25 | .23 | .25 | .23 | .25 |
| xx ............... lb. | .16 | .17 | .15 | .17 | .15 | .16 |
| No. 1 ............... lb. | .08 | .09 | .08 | .09 | .08 | .11 |
| No. 2 ............... lb. | .07 | .08 | .07 | .08 | .07 | .09 |
| Kauri, NY, San Francisco, | | | | | | |
| Brown XXX, cases .... lb. | .60 | .60½ | .60 | .60½ | ... | ... |
| BX ............... lb. | .33 | .33½ | .33 | .33½ | ... | ... |
| B1 ............... lb. | .19 | .19½ | .19 | .19½ | ... | ... |
| B2 ............... lb. | .14½ | .15 | .14½ | .15 | ... | ... |
| B3 ............... lb. | .12 | .12½ | .12 | .12½ | ... | ... |
| Pale XXX ............ lb. | .65 | .65½ | .65 | .65½ | ... | ... |
| No. 1 ............... lb. | .40 | .40½ | .40 | .40½ | ... | ... |
| No. 2 ............... lb. | .22 | .22½ | .22 | .22½ | ... | ... |
| No. 3 ............... lb. | .15 | .15½ | .15 | .15½ | ... | ... |
| Kino, tins ............... lb. | .70 | .80 | .70 | .80 | .75 | .80 |
| Mastic ............... lb. | .55 | .55½ | .46 | .55½ | .35 | .55½ |
| Sandarac, prime quality, 200 lb bgs & 300 lb cks ... lb. | .26¼ | .26½ | .26¼ | .35½ | .35 | .50 |
| Senegal, picked bgs ...... lb. | .20 | .21 | .20 | .21 | 17 | .21 |
| Sorts ............... lb. | .11½ | .12½ | .09⅜ | .12½ | .08 | .10 |
| Thus, bbls .......... 280 lbs. | ... | 11.00 | 10.50 | 11.00 | 9.50 | 10.75 |
| Strained .......... 280 lbs. | ... | 11.00 | 10.50 | 11.00 | 9.50 | 10.75 |
| Tragacanth, No. 1, cases ........ lb. | 1.20 | 1.25 | 1.15 | 1.30 | 1.00 | 1.20 |
| No. 2 ............... lb. | 1.10 | 1.15 | 1.05 | 1.20 | ... | ... |
| No. 3 ............... lb. | .95 | 1.00 | .95 | 1.05 | ... | ... |
| No. 4 ............... lb. | .85 | .90 | .85 | .95 | ... | ... |
| No. 5 ............... lb. | .75 | .80 | .75 | .85 | ... | ... |
| No. 6, bgs ............ lb. | .14 | .15 | .14 | .15 | ... | ... |
| Sorts, bgs ............ lb. | ... | .25 | .11 | .25 | ... | ... |
| Yacca, bgs ............ lb. | .03¼ | .03¾ | .03¼ | .03¾ | .03¼ | .04 |

| | Current Market | | 1935 Low | 1935 High | 1934 Low | 1934 High |
|---|---|---|---|---|---|---|
| Helium, cyl. (200 cu. ft.) cyl. | ... | 25.00 | ... | 25.00 | 25.00 | 25.00 |
| Hematite crystals, 400 lb bbls ......lb. | .16 | .18 | .16 | .18 | .16 | .18 |
| Paste, 500 bbls ........lb. | ... | .11 | ... | .11 | ... | .11 |
| Hemlock 25%, 600 lb bbls wks ......lb. | ... | .02⅞ | ... | .02⅞ | .02⅞ | .04½ |
| tks ......lb. | ... | .02½ | ... | .02½ | ... | ... |
| Hexalene, 50 gal drs wks..lb. | ... | .30 | ... | .30 | ... | .30 |
| Hexane, normal 60-70°C. Group 3, tks ........gal. | ... | .14 | ... | .14 | ... | .14 |
| Hexamethylenetetramine, drs ......lb. | .37 | .39 | .37 | .39 | .37 | .39 |
| Hexyl Acetate, delv drs ...lb. | .12 | .12½ | .12 | .12½ | .12 | .12½ |
| tks ......lb. | ... | .11½ | ... | .11½ | ... | ... |
| Hoof Meal, f.o.b. Chicago unit | ... | 2.50 | 2.50 | 2.70 | 1.85 | 2.70 |
| South Amer. to arrive unit | ... | 1.85 | ... | 1.85 | 1.65 | 1.80 |
| Hydrogen Peroxide, 100 vol, 140 lb cbys ..........lb. | .20 | .21 | .20 | .21 | .20 | .21 |
| Hydroxyamine Hydrochloride ......lb. | ... | 3.15 | ... | 3.15 | ... | 3.15 |
| Hypernic, 51°, 600 lb bbls lb. | .17 | .20 | .17 | .20 | .17 | .20 |
| Indigo Madras, bbls ......lb. | 1.25 | 1.30 | 1.25 | 1.30 | 1.25 | 1.30 |
| 20% paste, drs ........lb. | .15 | .18 | .15 | .18 | .15 | .18 |
| Synthetic, liquid .......lb. | ... | .12 | ... | .12 | ... | .12 |
| Iodine, Resublimed, kgs ..lb. | 1.65 | 1.75 | ... | 1.90 | 1.90 | 2.30 |
| Irish Moss, ord, bales ....lb. | .09 | .10 | .09 | .10 | .07 | .10 |
| Bleached, prime, bales ..lb. | .18 | .19 | .18 | .19 | .14 | .19 |
| Iron Acetate Liq. 17°, bbls lb. | .03 | .04 | .03 | .04 | .03 | .04 |
| Chloride see Ferric Chloride. | | | | | | |
| Nitrate, coml, bbls ..100 lb. | 2.75 | 3.25 | 2.75 | 3.25 | 2.75 | 3.25 |
| Oxide, English ........lb. | .07½ | .08¾ | .07½ | .08¾ | .07½ | .09 |
| Isobutyl Carbinol (128-132°C) drs, wks ............lb. | .33 | .34 | .33 | .34 | .34 | .34 |
| tks, wks ......lb. | ... | .32 | ... | .32 | .32 | .326 |
| Isopropyl Acetate, tks ....lb. | ... | .07½ | ... | .07½ | .07 | .07½ |
| drs, frt allowed ........lb. | .08½ | .09 | .08½ | .09 | ... | ... |
| Ether, see Ether, isopropyl. | | | | | | |
| Keiselguhr, 95 lb bgs, NY, Brown ............ton | 60.00 | 70.00 | 60.00 | 70.00 | 60.00 | 70.00 |
| Lead Acetate, brown, broken, f.o.b. NY, bbls .......lb. | ... | .09½ | ... | .09½ | .09½ | .09½ |
| White, broken, bbls ....lb. | ... | .11 | ... | .11 | .11 | .11 |
| cryst bbls ...........lb. | ... | .10½ | ... | .10½ | .10½ | .10½ |
| gran, bbls ...........lb. | ... | .11 | ... | .11 | .11 | .11 |
| powd, bbls ...........lb. | ... | .11¼ | ... | .11¼ | .11¼ | .11¼ |
| Arsenate, East, jobbers, drs ......lb. | .09 | .09⅜ | .09 | .09½ | ... | ... |
| Dealers, drs ...........lb. | .09¼ | .10¾ | .09¼ | .10¾ | ... | ... |
| West, jobbers, drs .....lb. | ... | .09 | ... | .09 | ... | ... |
| dealers, drs ..........lb. | ... | .10 | ... | .10 | ... | ... |
| Linoleate, solid bbls ......lb. | .26 | .26½ | .26 | .26½ | .26 | .26½ |
| Metal, c-l, NY .......100 lb | ... | 4.50 | 3.50 | 4.50 | 3.50 | 4.25 |
| Red, dry, 95% $Pb_3O_4$, delv ......lb. | .07 | .08 | .06 | .08 | .06 | .07¾ |
| 97% $Pb_2O_4$, delv .....lb. | .07¼ | .08¼ | .06¼ | .08¼ | ... | ... |
| 98% $Pb_2O_4$, delv ....lb. | .07½ | .08½ | .06½ | .08½ | ... | ... |
| Nitrate, 500 lb bbls, wks..lb. | .10 | .14 | .10 | .14 | .10 | .14 |
| Oleate, bbls ............lb. | .15 | .16 | .15 | .16 | .15 | .16 |
| Resinate, precip, bbls ...lb. | ... | .14 | ... | .14 | .14 | .18½ |
| Stearate, bbls ..........lb. | .22 | .23 | .22 | .23 | .22 | .23 |
| White, 500 lb bbls, wks..lb. | .06½ | .07 | .06½ | .07 | .06½ | .07 |
| Sulfate, 500 lb bbls, wks lb. | ... | .06 | ... | .06 | ... | .06 |
| Lime, chemical quicklime, f.o.b., wks, bulk .....ton | 7.00 | 7.25 | 7.00 | 7.25 | ... | ... |
| Hydrated, f.o.b., wks ..ton | 8.50 | 12.00 | 8.50 | 12.00 | ... | ... |
| Lime Salts, see Calcium Salts. | | | | | | |
| Lime sulfur, dealers, tks..gal. | ... | .11 | .10½ | .11 | ... | ... |
| drs ................gal. | .13 | .16 | .13 | .16½ | ... | ... |
| Dry, bgs, jobbers.......lb. | .07¼ | .10¼ | ... | ... | ... | ... |
| Linseed Meal, bgs .......ton | ... | 27.50 | 25.50 | 40.00 | 30.50 | 41.00 |
| Litharge, coml, delv, bbls..lb. | .06 | .07 | .05 | .07 | .051 | .06¾ |
| Lithopone, dom, ordinary, delv, bgs ...........lb. | .04½ | .04¾ | .04½ | .04¾ | .04½ | .04¾ |
| bbls ................lb. | .04¾ | .05 | .04¾ | .05 | .04¾ | .05 |
| High strength, bgs .....lb. | .06 | .06¼ | .06 | .06¼ | .06 | .06¼ |
| bbls ................lb. | .06¼ | .06½ | .06¼ | .06½ | .06¼ | .06½ |
| Titanated, bgs .........lb. | .06 | .06¼ | .06 | .06¼ | .06 | .06¼ |
| bbls ................lb. | .06¼ | .06½ | .06¼ | .06½ | .06¼ | .06½ |
| Logwood, 51°, 600 lb bbls lb. | .08½ | .10½ | .08½ | .10½ | .08½ | .12½ |
| Solid, 50 lb boxes ......lb. | .13½ | .17½ | .13½ | .17½ | .13½ | .17½ |
| Sticks ...............ton | 24.00 | 26.00 | 24.00 | 26.00 | 24.00 | 26.00 |
| Madder, Dutch ..........lb. | .22 | .25 | .22 | .25 | .22 | .25 |
| Magnesite, calc, 500 lb bbl ton | 60.00 | 65.00 | 60.00 | 65.00 | 55.00 | 65.00 |
| Magnesium Carb, tech, 70 lb bgs, wks ..............lb. | .06 | .06½ | .06 | .06½ | .06 | .06½ |
| Chloride flake, 375 lb drs, c-l, wks ................ton | 36.00 | 39.00 | 36.00 | 39.00 | 34.00 | 39.00 |
| Magnesium fluosilicate, crys, 400 lb bbls, wks .....lb. | .10 | .10½ | .10 | .10½ | .10 | .10½ |
| Oxide, USP, light, 100 lb. bbls ................lb. | ... | .42 | ... | .42 | ... | .42 |
| Heavy, 250 lb bbls ...lb. | ... | .50 | ... | .50 | ... | .50 |
| Palmitate, bbls ........lb. | .23 | .24 | .22 | .24 | .21 | .23 |
| Stearate, bbls ..........lb. | .20 | .22 | .19 | .22 | ... | ... |
| Linoleate, lig drs ......lb. | .18 | .19 | .18 | .19 | .18 | .19 |
| Resinate, fused, bbls ...lb. | .08¼ | .08½ | .08¼ | .08½ | .08¼ | .08½ |
| precip, bbls .........lb. | ... | .12 | ... | .12 | .11½ | .12½ |
| Manganese Borate, 30%, 200 lb bbls ..............lb. | .15 | .16 | .15 | .16 | .15 | .16 |
| Chloride, 600 lb cks ....lb. | .09 | .12 | .09 | .12 | .07 | .12 |
| Dioxide, tech (peroxide), paper bgs, c-l .......ton | ... | 50.00 | 45.00 | 50.00 | ... | ... |
| Mangrove 55%, 400 lb bbls lb. | ... | .04 | ... | .04 | ... | .04 |
| Bark, African .........ton | 27.00 | 28.00 | 27.00 | 30.00 | 26.00 | 32.00 |
| Marble Flour, blk .......ton | 12.00 | 13.00 | 12.00 | 13.00 | 12.00 | 13.00 |
| Mercuric chloride ........lb. | .71 | .76 | .71 | .93 | .73 | .93 |

| | Current Market | | 1935 Low | 1935 High | 1934 Low | 1934 High |
|---|---|---|---|---|---|---|
| Mercury metal ...76 lb. flasks | 75.00 | 77.00 | 69.00 | 77.00 | 66.50 | 79.00 |
| Meta-nitro-aniline ........lb. | .67 | .69 | .67 | .69 | .67 | .69 |
| Meta-nitro-paratoluidine 200 lb bbls ..............lb. | 1.40 | 1.55 | 1.40 | 1.55 | 1.40 | 1.55 |
| Meta-phenylene-diamine 300 lb bbls ..............lb. | .80 | .84 | .80 | .84 | .80 | .84 |
| Peroxide, 100 lb cs ....lb. | 1.20 | 1.25 | 1.20 | 1.25 | 1.20 | 1.25 |
| Silicofluoride, bbls .....lb. | .09 | .10 | .09 | .10 | .09 | .11 |
| Stearate, bbls ..........lb. | .19 | .20 | .19 | .20 | .19 | .20 |
| Meta-toluene-diamine, 300 lb bbls ..............lb. | .67 | .69 | .67 | .69 | .67 | .69 |
| Methanol, 95%, frt allowed, drs ..............gal. *o* | .37½ | .58 | .37½ | .58 | .37½ | .58 |
| tks, frt allowed ....gal. *o* | .33 | .36½ | .33 | .36½ | .33 | .36½ |
| 97% frt allowed, drs gal. *o* | .38½ | .59 | .38½ | .59 | .38½ | .59 |
| tks, frt allowed ....gal. *o* | .34 | .37½ | .34 | .37½ | .34 | .37½ |
| Pure, frt allowed, drs gal. *o* | .40 | .61 | .40 | .61 | .40 | .61 |
| tks, frt allowed ....gal. *o* | .35½ | .39 | .35½ | .39 | .35½ | .39 |
| Synthetic, frt allowed, drs ..............gal. *o* | .40 | .61 | .40 | .61 | .40 | .61 |
| tks, frt allowed ....gal. *o* | .35½ | .39 | .35½ | .39 | .35½ | .39 |
| Methyl Acetate, dom, 98-100%, drs ..........lb. | .18 | .18½ | .18 | .18½ | .18 | .18½ |
| Synthetic, 410 lb drs ...lb. | .16 | .17 | .16 | .17 | .16 | .17 |
| tks ..................lb. | ... | .15 | ... | .15 | .15 | .15 |
| Acetone, frt allowed, drs ..............gal. *p* | .49½ | .68½ | .49½ | .73½ | ... | ... |
| tks, frt allowed, drs gal. *p* | .44 | ... | .44 | .52½ | ... | ... |
| Synthetic, frt allowed, east of Rocky M., drs gal. *p* | .57½ | .60 | .57½ | .60 | .57½ | .60 |
| tks, frt allowed ...... | ... | .53 | ... | .53 | ... | ... |
| West of Rocky M., frt allowed, drs ....gal. *p* | .60 | .63 | .60 | .63 | ... | ... |
| tks, frt allowed ..gal. *p* | ... | .56 | ... | .56 | ... | ... |
| Hexyl Ketone, pure, drs lb. | ... | .60 | ... | .60 | .60 | 1.20 |
| Anthraquinone ........lb. | .65 | .67 | .65 | .67 | .65 | .67 |
| Butyl Ketone, tks ......lb. | ... | .10½ | ... | .10½ | .10½ | .10½ |
| Chloride, 90 lb cyl .....lb. | ... | .45 | ... | .45 | .45 | .45 |
| Ethyl Ketone, tks ......lb. | ... | .07½ | ... | .07½ | .07½ | .07½ |
| Propyl carbinol, drs ...lb. | .60 | .75 | .60 | .75 | .60 | .75 |
| Mica, dry grd, bgs, wks ..lb. | 35.00 | ... | 35.00 | ... | ... | ... |
| Michler's Ketone, kgs ....lb. | ... | 2.50 | ... | 2.50 | ... | 2.50 |
| Molasses, blackstrap, tks, f.o.b. NY ..........gal. | .08 | .08¼ | .07¾ | .08¼ | .06 | .09 |
| Monoamylamine, drs, wks lb. | ... | 1.00 | ... | 1.00 | ... | 1.00 |
| Monochlorobenzene, see Chlorobenzene, mono. | | | | | | |
| Monoethanolamine, tks, wks lb. | ... | .30 | ... | ... | ... | ... |
| Monomethylparaminosulfate, 100 lb drs ...........lb. | 3.75 | 4.00 | 3.75 | 4.00 | 3.75 | 4.00 |
| Myrobalans 25%, liq bbls..lb. | ... | .04¼ | ... | .04¼ | .03¾ | .04¼ |
| 50% Solid, 50 lb boxes lb. | .06 | .06¼ | .06 | .06¼ | .06 | .06¼ |
| J1 bgs ...............ton | 23.50 | 24.50 | 23.50 | 27.00 | 24.50 | 32.00 |
| J2 bgs ...............ton | ... | 15.00 | 15.00 | 15.75 | 15.75 | 18.00 |
| R2 bgs ...............ton | ... | 15.25 | 16.00 | 16.50 | 16.25 | 18.00 |
| Naphtha. v.m. & p. (deodorized) see petroleum solvents. | | | | | | |
| Naphtha, Solvent, water-white, tks ..................gal. | ... | .30 | .26 | .30 | .26 | .30 |
| drs, c-l ..............gal. | ... | .35 | .31 | .35 | .31 | .35 |
| Naphthalene, dom, crude, bgs, wks ................lb. | ... | 3.00 | 1.65 | 3.00 | ... | ... |
| Imported, cif, bgs ....lb. | ... | ... | 1.90 | 3.00 | 1.75 | 1.90 |
| Dyestuffs, bgs, bbls, Eastern wks ..............lb. | .06 | .07 | .04¼ | .07 | ... | ... |
| Balls, flakes, pks .....lb. | ... | .07¼ | | | | |
| Balls, ref'd, bbls, Eastern wks ................lb. | ... | .06¾ | .04½ | .06¾ | ... | ... |
| Flakes, ref'd, bbls, Eastern wks ................lb. | ... | .06¾ | .04½ | .06¾ | ... | ... |
| Dyestuffs, bgs, bbls, Mid-West wks .........lb. *q* | .06½ | .07½ | .04¾ | .07½ | ... | ... |
| Balls, ref'd, bbls, Mid-West wks ...............lb. *q* | ... | .07¼ | .05 | .07½ | ... | ... |
| Flakes, ref'd, bbls, Mid-West wks .........lb. *q* | ... | .07¼ | .05 | .07¼ | ... | ... |
| Nickel Carbonate, bbls....lb. | ... | .36 | .35 | .36 | ... | ... |
| Chloride, bbls ..........lb. | .18 | .19 | .18 | .19 | .18 | .19 |
| Oxide, 100 lb kgs, NY..lb. | .35 | .37 | .35 | .37 | .35 | .37 |
| Salt, 400 lb bbls, NY ...lb. | .13 | .13½ | .12½ | .13½ | .11½ | 13 |
| Single, 400 lb bbls, NY lb. | .13 | .13½ | .11½ | .13½ | .11½ | .12 |
| Metal ingot ...........lb. | ... | .35 | ... | .35 | .35 | .35 |
| Nicotine, free 50%, 8 lb tins, cases ................ | 8.25 | 10.15 | 8.25 | 10.15 | 8.25 | 10.15 |
| Sulfate, 55 lb drs ......lb. | .77 | .80 | .67 | .80 | .67 | .75 |
| Nitre Cake, blk ..........ton | 12.00 | 14.00 | 12.00 | 14.00 | 12.00 | 14.00 |
| Nitrobenzene, redistilled, 1000 lb drs, wks ..........lb. | .09 | .11 | .09 | .11 | .09 | .11 |
| tks ..................lb. | ... | .08½ | ... | .08½ | ... | .08½ |
| Nitrocellulose, c-l-l cl, wks lb. | .27 | .34 | .27 | .34 | .27 | .34 |
| Nitrogenous Mat'l, bgs, imp unit | ... | 2.30 | 2.20 | 2.75 | ... | ... |
| dom, Eastern wks ....unit | ... | 2.25 | 2.20 | 2.40 | 2.35 | 3.25 |
| dom, Western wks ....unit | ... | 2.00 | 1.90 | 2.30 | ... | ... |
| Nitronaphthalene, 550 lb bbls lb. | .24 | .25 | .24 | .25 | .24 | .25 |
| Nutgalls Aleppy, bgs .....lb. | .16 | .18 | .12 | .18 | .18 | .20 |
| Chinese, bgs ...........lb. | .19 | .20 | .19 | .20 | .17 | .20 |
| Oak Bark Extract, 25%, bbls lb. | ... | .03½ | ... | .03½ | .03⅜ | .03½ |
| tks ..................lb. | ... | .02¾ | ... | .02¾ | ... | ... |
| Octyl Acetate, tks, wks ...lb. | ... | .15 | ... | ... | ... | ... |
| Orange-Mineral, 1100 lb cks NY ..................lb. | .10 | .10½ | .09¼ | .10½ | .09¼ | .10½ |
| Orthoaminophenol, 50 lb kgs.lb. | 2.15 | 2.25 | 2.15 | 2.25 | 2.15 | 2.25 |
| Orthoanisidine, 100 lb drs lb. | .82 | .84 | .82 | .84 | .82 | 1.15 |
| Orthochlorophenol, drs ....lb. | .50 | .65 | .50 | .65 | .50 | .65 |
| Orthocresol, drs .........lb. | .13 | .15 | .13 | .15 | .13 | .15 |
| Orthodichlorobenzene, 1000 lb drs ..............lb. | .05½ | .06 | .05½ | .06 | .05½ | .06 |

*o* Country is divided in 5 zones, prices varying by zone. In drum prices range covers both zone and c-l and lcl quantities in the 5 zones; in each case, bbl. prices are 2½c higher; synthetic is not shipped in bbls.; *p* Country is divided into 5 zones. Also see footnote directly above; *q* Naphthalene quoted on Pacific Coast F.A.S. Phila. or N. Y.

| | Current Market | | 1935 Low | 1935 High | 1934 Low | 1934 High |
|---|---|---|---|---|---|---|
| Orthonitrochlorobenzene, 1200 lb drs, wks ....lb. | .28 | .29 | .28 | .29 | .28 | .29 |
| Orthonitrotoluene, 1000 lb drs, wks ....lb. | .07 | .10 | .05½ | .10 | .05½ | .06 |
| Orthonitrophenol, 350 lb drs ....lb. | .52 | .80 | .52 | .80 | .52 | .80 |
| Orthotoluidine, 350 lb bbls, l-c-l ....lb. | .14½ | .15 | .14½ | .15 | .14 | .15 |
| Orthonitroparachlorphenol, tins ....lb. | .70 | .75 | .70 | .75 | .70 | .75 |
| Osage Orange, cryst ....lb. | .17 | .25 | .17 | .25 | .16 | .25 |
| 51 deg liquid ....lb. | .07 | .07¾ | .07 | .07¾ | .07 | .07¾ |
| Powd, 100 lb bgs ....lb. | .14½ | .15 | .14½ | .15 | .14½ | .15 |
| Paraffin, refd, 200 lb cs slabs | | | | | | |
| 122-127 deg M P ....lb. | .04 | .04¾ | .04 | .04¾ | .04½ | .04¾ |
| 128-132 deg M P ....lb. | .05 | .0515 | .05 | .0515 | .04¾ | .0515 |
| 133-137 deg M P ....lb. | .0575 | .06 | .0575 | .06 | .05 | .06 |
| Para aldehyde, 110-55 gal drs ....lb. | .16 | .18 | .16 | .18 | .16 | .18 |
| Aminoacetanilid, 100 lb kgs ....lb. | ... | .85 | ... | .85 | .52 | .85 |
| Aminohydrochloride, 100 lb kgs ....lb. | 1.25 | 1.30 | 1.25 | 1.30 | 1.25 | 1.30 |
| Aminophenol, 100 lb kgs lb. | ... | 1.05 | ... | 1.05 | .78 | 1.05 |
| Chlorophenol, drs ....lb. | .50 | .65 | .50 | .65 | .50 | .65 |
| Coumarone, 330 lb drs ..lb. | ... | ... | ... | ... | ... | ... |
| Cymene, refd, 110 gal dr ....gal. | 2.25 | 2.50 | 2.25 | 2.50 | 2.25 | 2.50 |
| Dichlorobenzene 150 lb bbls wks ....lb. | .16 | .20 | .16 | .20 | .16 | .20 |
| Formaldehyde, bbls, wks lb. | .38 | .39 | .38 | .39 | ... | ... |
| Nitroacetanilid, 300 lb bbls ....lb. | .45 | .52 | .45 | .52 | .45 | .52 |
| Nitroaniline, 300 lb bbls, wks ....lb. | .48 | .55 | .48 | .55 | .48 | .55 |
| Nitrochlorobenzene, 1200 lb drs, wks ....lb. | .23½ | .24 | .23½ | .24 | .23½ | .24 |
| Nitro-orthotoluidine, 300 lb bbls ....lb. | 2.75 | 2.85 | 2.75 | 2.85 | 2.75 | 2.85 |
| Nitrophenol, 185 lb bbls lb. | .45 | .50 | .45 | .50 | .45 | .50 |
| Nitrosodimethylaniline, 120 lb bbls ....lb. | .92 | .94 | .92 | .94 | .92 | .94 |
| Nitrotoluene, 350 lb bbls lb. | .35 | .37 | .35 | .37 | .35 | .37 |
| Phenylenedamine, 350 lb bbls ....lb. | 1.25 | 1.30 | 1.25 | 1.30 | 1.25 | 1.30 |
| Para Tertiary amyl phenol, wks, drs ....lb. | .32 | .50 | .32 | .50 | .32 | .50 |
| Toluenesulfonamide, 175 lb bbls ....lb. | .70 | .75 | .70 | .75 | .70 | .75 |
| tks, wks ....lbs. | ... | .31 | ... | .31 | ... | .. |
| Toluenesulfonchloride, 410 lb bbls, wks ....lb. | .20 | .22 | .20 | .22 | .20 | .22 |
| Toluidine, 350 lb bbls, wks ....lb. | .56 | .60 | .56 | .60 | .56 | .60 |
| Paris Green, Arsenic Basis | | | | | | |
| 100 lb kgs ....lb. | ... | .24 | ... | .24 | .23 | .24 |
| 250 lb kgs ....lb. | ... | .22 | ... | .22 | ... | .22 |
| Perchlorethylene, 50 gal drs ....lb. | ... | .15 | ... | .15 | ... | .15 |
| Persian Berry Ext, bbls ..lb. | .55 | Nom. | .55 | Nom. | .55 | Nom. |
| Pentane, normal, 28-38°C, group 3 tks ....gal. | ... | .09 | ... | .09 | .09 | .09 |
| drs, group 3 ....gal. | .10 | .15 | .10 | .15 | ... | ... |
| Petrolatum, dark amber, bbls ....lb. | .02⅝ | .02⅞ | .02 | .02⅞ | ... | ... |
| Light, bbls ....lb. | .03⅛ | .03⅜ | .02½ | .03⅜ | ... | ... |
| Medium, bbls ....lb. | .02⅞ | .03⅛ | .02¼ | .03⅛ | ... | ... |
| Dark green, bbls ....lb. | .02½ | .02¾ | .02½ | .02¾ | ... | ... |
| White, lily, bbls ....lb. | .06 | .06¼ | .05¼ | .06½ | ... | ... |
| White, snow, bbls ....lb. | .07 | .07¼ | .06¼ | .07½ | ... | ... |
| Red, bbls ....lb. | .02⅝ | .02⅛ | .02¼ | .02⅞ | ... | ... |
| Petroleum Ether, 30-60°, group 3, tks ....gal. | ... | .13 | ... | .13 | .11 | .13 |
| drs, group 3 ....gal. | .15 | .16 | .15 | .16 | .15 | .17 |

**PETROLEUM SOLVENTS AND DILUENTS**

| | Current Market | | 1935 Low | 1935 High | 1934 Low | 1934 High |
|---|---|---|---|---|---|---|
| Cleaners naphthas, group 3, tks, wks ....gal. | .06⅞ | .07¼ | .06⅞ | .07¼ | ... | ... |
| Bayonne, tks, wks ..gal. | ... | .09 | ... | .09 | ... | ... |
| West Coast, tks ....gal. | ... | .15 | ... | .15 | ... | ... |
| Hydrogenated naphthas, frt allowed East, tks ...gal. | ... | .15 | .15 | .17½ | ... | ... |
| No. 2, tks ....gal. | ... | .18 | .18 | .22½ | ... | ... |
| No. 3, tks ....gal. | ... | .15 | .15 | .17½ | ... | ... |
| No. 4, tks ....gal. | ... | .18 | .18 | .22½ | ... | ... |
| Lacquer diluents, tks, Bayonne ....gal. | .12 | .12½ | .12 | .12½ | .12 | .12½ |
| Group 3, tks ....gal. | .07⅞ | .08 | .07⅞ | .08 | .06⅞ | .08⅜ |
| Naphtha, V.M.P., East, tks, wks ....gal. | ... | .09 | ... | .09 | .09 | .09½ |
| Group 3, tks, wks ...gal. | .06⅞ | .07¼ | .06⅞ | .07¼ | .06¼ | .07¼ |
| Petroleum thinner, East, tks, wks ....gal. | ... | .09 | ... | .09 | .09 | .09 |
| Group 3, tks, wks ...gal. | .05⅞ | .06⅛ | .05⅞ | .06¼ | .05⅞ | .06⅜ |
| Rubber Solvents, stand grd, East, tks, wks ....gal. | ... | .09 | ... | .09 | .09 | .09½ |
| Group 3, tks, wks ..gal. | .06⅞ | .07¼ | .06⅞ | .07¼ | .06⅜ | .06⅞ |
| Stoddard Solvent, East, tks, wks ....gal. | ... | .09 | ... | .09 | .09 | .09½ |
| Group 3, tks, wks ...gal. | .06⅜ | .07 | .06⅜ | .07 | .05¾ | .07⅛ |
| Phenol, 250-100 lb drs ....lb. | .14¼ | .15 | .14¼ | .15 | .14¼ | .15 |
| Phenyl-Alpha-Naphthylamine, 100 lb kgs ....lb. | ... | 1.35 | ... | 1.35 | ... | 1.35 |
| Phenyl Chloride, drs ....lb. | ... | .16 | ... | .16 | ... | .16 |
| Phenylhydrazine Hydrochloride ....lb. | 2.90 | 3.00 | 2.90 | 3.00 | 2.90 | 3.00 |
| Phloroglucinol, tech, tins ..lb. | 15.00 | 16.50 | 15.00 | 16.50 | 15.00 | 16.50 |
| CP, tins ....lb. | 20.00 | 22.00 | 20.00 | 22.00 | 20.00 | 22.00 |

## *Current*

**Phosphate Rock**
**Rosin Oil**

| | Current Market | | 1935 Low | 1935 High | 1934 Low | 1934 High |
|---|---|---|---|---|---|---|
| Phosphate Rock, f.o.b. mines | | | | | | |
| Florida Pebble, 68% basis ....ton | ... | 3.40 | 3.25 | 3.40 | 2.85 | 3.25 |
| 70% basis ....ton | ... | 3.90 | ... | 3.90 | 3.35 | 3.90 |
| 72% basis ....ton | ... | 4.40 | ... | 4.40 | 3.85 | 4.40 |
| 75-74% basis ....ton | ... | 5.40 | ... | 5.40 | 4.90 | 5.40 |
| 75% basis ....ton | ... | 5.50 | ... | 5.50 | 5.05 | 5.50 |
| 77-80% basis ....ton | ... | 6.50 | ... | 6.50 | 5.90 | 6.50 |
| Tennessee, 72% basis ..ton | ... | 4.75 | ... | 4.75 | 4.75 | 5.00 |
| Phosphorous Oxychloride 175 lb cyl ....lb. | .16 | .20 | .16 | .20 | .16 | .20 |
| Red, 110 lb cases ....lb. | .44 | .45 | .44 | .45 | .44 | .45 |
| Yellow, 110 lb cs, wks..lb. | .28 | .33 | .28 | .33 | .28 | .33 |
| Sesquisulfide, 100 lb cs..lb. | .38 | .44 | .38 | .44 | .38 | .44 |
| Trichloride, cyl ....lb. | .16 | .20 | .16 | .20 | .16 | .20 |
| Phthalic Anhydride, 100 lb drs, wks ....lb. | .14½ | .15½ | .14½ | .15½ | .14½ | .15½ |
| Pine Oil, 55 gal drs or bbls | | | | | | |
| Destructive dist ....lb. | .44 | .46 | .44 | .50 | .48 | .62 |
| Steam dist wat wh bbls gal. | .64 | .65 | .64 | .65 | .64 | .65 |
| tks ....gal. | ... | .59 | ... | .59 | ... | ... |
| Straw color, bbls ....gal. | ... | .59 | ... | .59 | ... | ... |
| tks ....gal. | ... | .54 | ... | .54 | ... | ... |
| Pitch Hardwood, wks ....ton | ... | 15.00 | 15.00 | 20.00 | ... | 20.00 |
| Burgundy, dom, bbls, wks ....lb. | ... | .03½ | ... | .03½ | ... | ... |
| Imported ....lb. | .11 | .13 | .11 | .13 | ... | ... |
| Coaltar, bbls, wks ....ton | ... | 19.00 | ... | 19.00 | ... | ... |
| Petroleum, see Asphaltum in Gums' Section. | | | | | | |
| Pine, bbls ....bbl. | 3.75 | 4.25 | 3.75 | 4.25 | ... | ... |
| Stearin, drs ....lb. | .03 | .04½ | .03 | .04½ | ... | ... |
| Platinum, refd ....oz. | 34.50 | 38.00 | 35.00 | 38.00 | 35.00 | 38.00 |

POTASH

| | Current Market | | 1935 Low | 1935 High | 1934 Low | 1934 High |
|---|---|---|---|---|---|---|
| Potash, Caustic, wks, sol..lb. | .06¼ | .06½ | .06¼ | .06½ | .06¼ | .07⅜ |
| flake ....lb. | .07 | .07⅜ | .07 | .07⅜ | .07 | .08¼ |
| Liquid tks ....lb. | ... | .02⅞ | ... | .02⅞ | .02⅞ | .03⅝ |
| Potash Salts, Rough Kainit 14% basis ....ton | ... | 8.50 | ... | 8.50 | 8.50 | 9.70 |
| Manure Salts, imported | | | | | | |
| 20% basis, blk ....ton | ... | 11.00 | 8.60 | 11.00 | 8.60 | 12.00 |
| 30% basis, blk ....ton | ... | 14.40 | 12.90 | 14.40 | 12.90 | 19.15 |
| Domestic, cif ports, blk unit | ... | .43 | ... | .43 | ... | ... |
| Potassium Acetate ....lb. | .26 | .28 | .26 | .28 | .26 | .28 |
| Potassium Muriate, 80% basis bgs ....ton | ... | 22.50 | 22.00 | 22.50 | 22.00 | 37.15 |
| Dom, blk ....unit | ... | .45 | .40 | .45 | ... | ... |
| Pot & Mag Sulfate, 48% basis bgs ....ton | 22.25 | 22.50 | 19.50 | 22.50 | 22.50 | 25.00 |
| Potassium Sulfate, 90% basis bgs ....ton | ... | 33.75 | 33.75 | 35.00 | 35.00 | 42.15 |
| Potassium Bicarbonate, USP 320 lb bbls ....lb. | .07½ | .09 | .07½ | .09 | .07½ | .09 |
| Bichromate Crystals, 725 lb cks ....lb. | .08½ | .09 | .08⅛ | .09 | .08⅛ | .08⅝ |
| Binoxalate, 300 lb bbls..lb. | .22 | .23 | .22 | .23 | .14 | .23 |
| Bisulfate, 100 lb kgs ..lb. | .35 | .36 | .35 | .36 | .33 | .36 |
| Carbonate, 80-85% calc 800 lb cks ....lb. | .07¼ | .07½ | .07½ | .07⅞ | .07 | .07⅞ |
| liquid, tks ....lb. | ... | .. | ... | ... | ... | ... |
| drs, wks ....lb. | .03½ | .03¾ | ... | ... | ... | ... |
| Chlorate crys, powd, 112 lb kgs, wks ....lb. | ... | .09¾ | ... | .09¾ | .08½ | .09¾ |
| gran, kgs ....lb. | .12 | .13 | .12 | .13 | ... | ... |
| powd, kgs ....lb. | .08¾ | .09¾ | .08¾ | .09¾ | ... | ... |
| Chloride, crys, bbls ....lb. | .04 | .04¾ | .04 | .04¾ | .04 | .04¾ |
| Chromate, kgs ....lb. | .23 | .28 | .23 | .28 | .23 | .28 |
| Cyanide, 110 lb cases ..lb. | .55 | .57½ | 55 | .57½ | .55 | .60 |
| Iodide, 75 lb bbls ....lb. | ... | 1.25 | 1.25 | 1.40 | 1.40 | 2.70 |
| Metabisulfite, 300 lb bbls lb. | ... | .15 | ... | .15 | .10½ | .15 |
| Oxalate, bbls ....lb. | .16 | .24 | .16 | .24 | .16 | .24 |
| Perchlorate, cks, wks ..lb. | .09 | .11 | .09 | .11 | .09 | .11 |
| Permanganate, USP, crys, 500 & 1000 lb drs, wks lb. | .18½ | .19½ | .18½ | .19½ | .18½ | .19½ |
| Prussiate, red, 112 lb kgs lb. | .35 | .38½ | .35 | .38½ | .35 | .39 |
| Yellow, 500 lb casks ..lb. | .18 | .19 | .18 | .19 | .18 | .19 |
| Tartrate Neut, 100 lb kgs lb. | ... | .21 | ... | .21 | ... | .21 |
| Titanium Oxalate, 200 lb bbls ....lb. | .32 | .35 | .32 | .35 | .32 | .35 |
| Propane, group 3, tks .... | ... | .07 | ... | .07 | ... | .07 |
| Pumice Stone, lump bgs ..lb. | .04½ | .06 | .04½ | .06 | .04½ | .06 |
| 250 lb bbls ....lb. | .05 | .07 | .05 | .07 | .05 | .07 |
| Powd, 350 lb bgs ....lb. | .02½ | .03 | .02½ | .03 | .02½ | .03 |
| Putty, coml, tubs ....100 lb. | ... | 2.75 | ... | 2.75 | 2.25 | 2.75 |
| Linseed Oil, kgs ...100 lb. | ... | 4.50 | ... | 4.50 | 4.00 | 4.50 |
| Pyridine, 50 gal drs ....gal. | ... | 1.25 | ... | 1.25 | ... | 1.25 |
| Pyrites, Spanish cif Atlantic ports, blk ....unit | .12 | .13 | .12 | .13 | .12 | .13 |
| Pyrocatechin, CP, drs, tins ....lb. | 2.40 | 2.75 | 2.40 | 3.00 | 2.75 | 3.00 |
| Quebracho, 35% liq tks ...lb. | ... | .02⅝ | ... | .02⅝ | .02¼ | .02⅝ |
| 450 lb bbls, c-l ....lb. | ... | .03⅛ | ... | .03⅛ | .02¾ | .03⅛ |
| Solid, 63%, 100 lb bales cif ....lb. | ... | .03⅝ | ... | .03⅝ | .02⅞ | .03⅝ |
| Clarified, 64%, bales..lb. | ... | .03⅞ | ... | .03⅞ | .03 | .03⅞ |
| Quercitron, 51 deg liq, 450 lb bbls ....lb. | .06 | .06½ | .06 | .06½ | .05½ | .06½ |
| Solid, 100 lb boxes ....lb. | .10 | .12 | .10 | .12 | .09½ | .13 |
| R Salt, 250 lb bbls, wks ..lb. | .44 | .45 | .44 | .45 | .40 | .45 |
| Resorcinol tech, cans ....lb. | .75 | .80 | .75 | .80 | .65 | .80 |
| Rochelle Salt, cryst ....lb. | .14 | .14½ | .14 | .15 | .12½ | .16 |
| Powd, bbls ....lb. | .13 | .13½ | .13 | .13½ | ... | ... |
| Rosin Oil, bbls, first run gal. | ... | .38 | .36 | .45 | .45 | .48 |
| Second run ....gal. | ... | .45 | .43 | .48 | .48 | .53 |
| Third run, drs ....gal. | ... | .53 | .50 | .60 | ... | ... |

| | Current Market | | 1935 Low | 1935 High | 1934 Low | 1934 High |
|---|---|---|---|---|---|---|
| Rosins 600 lb bbls, 280 lb unit ex. yard NY: | | | | | | |
| B | ... | 5.52½ | 4.65 | 5.65 | 4.50 | 5.70 |
| D | ... | 5.60 | 5.02½ | 5.75 | 4.60 | 5.85 |
| E | ... | 5.65 | 5.15 | 5.90 | 4.80 | 6.50 |
| F | ... | 5.70 | 5.20 | 5.95 | 5.00 | 6.75 |
| G | ... | 5.70 | 5.25 | 6.00 | 5.05 | 6.75 |
| H | ... | 5.72½ | 5.25 | 6.00 | 5.10 | 6.75 |
| I | ... | 5.72½ | 5.25 | 6.00 | 4.05 | 5.20 |
| K | ... | 5.75 | 5.27½ | 6.05 | 5.30 | 6.75 |
| M | ... | 5.72½ | 5.35 | 6.10 | 5.45 | 6.80 |
| N | ... | 5.87½ | 5.75 | 6.40 | 5.50 | 6.80 |
| WG | ... | 6.30 | 5.95 | 6.87½ | 5.70 | 6.80 |
| WW | ... | 6.95 | 6.25 | 7.55 | 5.90 | 6.85 |
| Rosins, Gum, Savannah (280 lb unit): | | | | | | |
| B | ... | 4.25 | 3.40 | 4.40 | ... | ... |
| D | ... | 4.35 | 3.70 | 4.50 | ... | ... |
| E | ... | 4.40 | 3.90 | 4.65 | ... | ... |
| F | ... | 4.42½ | 3.95 | 4.70 | ... | ... |
| G | ... | 4.45 | 4.00 | 4.75 | ... | ... |
| H | ... | 4.45 | 4.00 | 4.75 | ... | ... |
| I | ... | 4.45 | 4.00 | 4.75 | ... | ... |
| K | ... | 4.47½ | 4.02½ | 4.80 | ... | ... |
| M | ... | 4.55 | 4.10 | 4.85 | ... | ... |
| N | ... | 4.60 | 4.50 | 5.15 | ... | ... |
| WG | ... | 5.05 | 4.70 | 5.60 | ... | ... |
| WW | ... | 5.70 | 5.15 | 6.25 | ... | ... |
| X | ... | 5.70 | 5.20 | 6.25 | ... | ... |
| Rosins, Wood, wks (280 lb unit), wks, FF | ... | 4.75 | 4.05 | 6.35 | ... | ... |
| I | ... | 5.05 | 4.30 | 7.00 | ... | ... |
| M | ... | 5.30 | 4.55 | 7.25 | ... | ... |
| N | ... | 5.75 | 5.00 | 7.75 | ... | ... |
| Rosin, Wood. c-l, FF grade, NY | ... | 5.62 | 4.92 | 5.62 | 5.10 | 6.13 |
| Rotten Stone, bgs mines ..ton | 23.50 | 24.00 | 23.50 | 24.00 | 23.50 | 24.00 |
| Lump, imported, bbls ..lb. | .05 | .07 | .05 | .07 | .05 | .07 |
| Selected, bbls ........lb. | .08 | .10 | .08 | .10 | .08 | .12 |
| Powdered, bbls ........lb. | .02½ | .05 | .02½ | .05 | .02½ | .05 |
| Sago Flour, 150 lb bgs ....lb. | .02¾ | .03¾ | .02¾ | .03¾ | .02½ | .03¾ |
| Sal Soda, bbls, wks ..100 lb. | ... | 1.30 | ... | 1.30 | 1.10 | 1.30 |
| Salt Cake, 94-96%, c-l, wks ........ton | 13.00 | 18.00 | 13.00 | 18.00 | 13.00 | 18.00 |
| Chrome, c-l, wks ......ton | 12.00 | 13.00 | 12.00 | 13.00 | 12.00 | 13.00 |
| Saltpetre, double refd, gran, 450-500 lb bbls ......lb. | .059 | .06¼ | .059 | .06¼ | .059 | .06¼ |
| Powd, bbls ............lb. | .069 | .07⅞ | .069 | .07⅞ | ... | ... |
| Cryst, bbls ............lb. | .069 | .08 | .069 | .08 | ... | ... |
| Satin, White, 550 lb bbls ..lb. | ... | .01½ | ... | .01½ | ... | .01½ |
| Shellac, Bone dry, bbls ..lb. r | .24½ | .26½ | .19 | .32 | .26 | .37 |
| Garnet, bgs ...........lb. | .20 | .21 | .17 | .27 | .26 | .32 |
| Superfine, bgs ........lb. s | .17½ | .19 | .16 | .28 | .23 | .31 |
| T. N., bgs ...........lb. s | .15½ | .17 | .13 | .25 | ... | ... |
| Schaeffer's Salt, kgs ......lb. | .48 | .50 | .48 | .50 | .48 | .50 |
| Silver Nitrate, vials ......oz. | ... | .44⅝ | .38 | .53¾ | .31⅞ | .40½ |
| Slate Flour, bgs, wks ....ton | 9.00 | 10.00 | 9.00 | 10.00 | 9.00 | 10.00 |
| Soda Ash, 58% dense, bgs, c-l, wks .........100 lb. | ... | 1.25 | ... | 1.25 | ... | 1.25 |
| 58% light, bgs .....100 lb. | ... | 1.23 | ... | 1.23 | ... | 1.25 |
| blk ..............100 lb. | ... | 1.05 | ... | 1.05 | ... | 1.05 |
| paper bgs ........100 lb. | ... | 1.20 | ... | 1.20 | ... | 1.20 |
| bbls ..............100 lb. | ... | 1.50 | ... | 1.50 | ... | 1.50 |
| Soda Caustic, 76% grnd & flake, drs .........100 lb. | ... | 3.00 | ... | 3.00 | ... | 3.00 |
| 76% solid, drs .....100 lb. | ... | 2.60 | ... | 2.60 | ... | 2.60 |
| Liquid sellers, tks, 100 lbs. | ... | 2.25 | ... | 2.25 | ... | 2.25 |
| Sodium Abietate, drs .....lb. | ... | .08 | ... | .08 | .03 | .08 |
| Acetate, tech, 450 lb bbls, wks ................lb. | .04½ | .05 | .04½ | .05 | .04½ | .05 |
| Alignate, drs ..........lb. | ... | .64 | ... | .64 | .50 | .64 |
| Antimoniate, bbls ......lb. | .13¾ | .14¼ | ... | ... | ... | ... |
| Arsenate, drs ..........lb. | ... | .10½ | ... | .10½ | .07¾ | .10½ |
| Arsenite, liq, drs .....gal. | .40 | .75 | .40 | .75 | .40 | .75 |
| Benzoate, USP, kgs ...lb. | .46 | .48 | .46 | .48 | .45 | .48 |
| Bicarb, 400 lb bbl, wks. 100 lb. | ... | 1.85 | ... | 1.85 | 1.85 | 1.85 |
| Bichromate, 500 lb cks, wks ..................lb. | .06½ | .07 | .06⅛ | .07 | .06⅛ | .06⅝ |
| Bisulfite, 500 lb bbl, wks lb. | .03¼ | .036 | .03¼ | .036 | .03 | .036 |
| 35-40% sol cbys, wks 100 lb. | 1.95 | 2.10 | 1.95 | 2.10 | ... | ... |
| Chlorate, bgs, wks .....lb. | .06¼ | .07½ | .06¼ | .07½ | .06¼ | .07½ |
| Chloride, tech .........ton | 13.60 | 16.50 | 13.60 | 16.50 | 11.40 | 16.50 |
| Cyanide, 96-98%, 100 & 250 lb drs, wks ......lb. | .15½ | .17½ | .15½ | .17½ | .15½ | .17½ |
| Fluoride, 90%, 300 lb bbls, wks ................lb. | .07¼ | .08¼ | .07¼ | .08¼ | .07¼ | .09½ |
| Hydrosulfite, 200 lb bbls, f.o.b. wks ...........lb. | .18 | .19 | .18 | .21 | .19½ | .21 |
| Hyposulfite, tech, pea crys 375 lb bbls, wks 100 lb. | 2.50 | 3.00 | 2.50 | 3.00 | 2.40 | 3.00 |
| Tech, reg cryst, 375 lb bbls, wks ......100 lb. | 2.40 | 2.75 | 2.40 | 2.75 | 2.40 | 2.75 |
| Iodide ................lb. | 2.00 | 2.05 | 2.00 | 2.40 | 2.40 | 3.50 |
| Metanilate, 150 lb bbls ..lb. | .41 | .42 | .41 | .42 | .41 | .42 |
| Metasilicate, gran, c-l, wks ................100 lb. | 2.65 | 3.05 | 2.65 | 3.05 | 2.65 | 3.05 |
| cryst, bbls, wks ..100 lb. | ... | 3.25 | ... | 3.25 | ... | 3.25 |
| Monohydrate, bbls .....lb. | ... | .02½ | ... | .02½ | ... | .02½ |
| Napthenate, drs ........lb. | ... | .09 | ... | .09 | .09 | .13 |
| Naphthionate, 300 lb bbl lb. | .52 | .54 | .52 | .54 | .52 | .54 |
| Nitrate, 92%, crude, 200 lb bgs, c-l, NY ........ton | ... | 24.80 | ... | 24.80 | 24.80 | 26.30 |
| 100 lb bgs ..........ton | ... | 25.50 | ... | 25.50 | 25.50 | 27.00 |
| Bulk ...............ton | ... | 23.50 | ... | 23.50 | 23.50 | 24.50 |

r Bone dry prices at Chicago 1c higher; Boston ½c; Pacific Coast 3c; Philadelphia deliveries f.o.b. N. Y.; refined 6c higher in each case; s T. N. and Superfine prices quoted f.o.b. N. Y. and Boston; Chicago prices 1c higher; Pacific Coast 3c; Philadelphia f.o.b. N. Y.

## *Current*

**Sodium Nitrite**
**Thiocarbanilid**

| | Current Market | | 1935 Low | 1935 High | 1934 Low | 1934 High |
|---|---|---|---|---|---|---|
| Sodium (continued) | | | | | | |
| Nitrite, 500 lb bbls ....lb. | .0735 | .08 | .07¼ | .08 | .07¼ | .08 |
| Orthochlorotoluene, sulfonate, 175 lb bbls, wks lb. | .25 | .27 | .25 | .27 | .25 | .27 |
| Perborate, 275 lb bbls ..lb. | .17 | .18 | .17 | .19 | .18 | .19 |
| Peroxide, bbls, 400 lb ..lb. | ... | .17 | ... | .17 | ... | .17 |
| Phosphate, di-sodium, tech, 310 lb bbls, wks 100 lb. | ... | 2.30 | 2.20 | 2.30 | 2.10 | 2.40 |
| bgs, wks ......100 lb. | ... | 2.10 | 2.00 | 2.10 | ... | ... |
| tri-sodium, tech, 325 lb bbls, wks ......100 lb. | ... | 2.30 | 2.30 | 2.70 | 2.60 | 2.70 |
| bgs, wks ......100 lb. | ... | 2.10 | 2.10 | 2.60 | ... | ... |
| Picramate, 160 lb kgs ..lb. | .67 | .69 | .67 | .69 | .69 | .72 |
| Prussiate, Yellow, 350 lb bbl, wks ...........lb. | .11½ | .12 | .11½ | .12 | .11½ | .12 |
| Pyrophosphate, anhyd, 100 lb bbls ..............lb. | .102 | .132 | .102 | .15 | ... | .15 |
| Silicate, 60°, 55 gal drs, wks ...........100 lb. | 1.65 | 1.70 | 1.65 | 1.70 | 1.65 | 1.70 |
| 40°, 35 gal drs, wks 100 lb. | ... | .80 | ... | .80 | ... | .80 |
| tks, wks .......100 lb. | ... | .65 | ... | .65 | ... | .65 |
| Silicofluoride, 450 lb bbls NY ................lb. | ... | .05 | .04¼ | .05 | .04¾ | .06 |
| Stannate, 100 lb drs ....lb. | .34 | .37 | .31 | .38 | .33½ | .37½ |
| Stearate, bbls .........lb. | .20 | .25 | .20 | .25 | .20 | .25 |
| Sulfanilate, 400 lb bbls..lb. | .16 | .18 | .16 | .18 | .16 | .18 |
| Sulfate Anhyd, 550 lb bbls c-l, wks ........100 lb. ‡ | 1.30 | 1.55 | 1.25 | 2.35 | 2.20 | 2.85 |
| Sulfide, 80% cryst, 440 lb bbls, wks .........lb. | ... | .02¼ | ... | .02¼ | .02¼ | .02½ |
| 62% solid, 650 lb drs, c-l, wks ..............lb. | ... | .03 | ... | .03 | ... | .03 |
| Sulfite, cryst, 400 lb bbls, wks ................lb. | .023 | .02½ | .023 | .02½ | .02¼ | .02½ |
| Sulfocyanide, bbls .....lb. | .32 | .42½ | .32 | .42½ | .28 | .42½ |
| Tungstate, tech, crys, kgs ....................lb. | ... | .90 | ... | .90 | .70 | .90 |
| Spruce Extract, ord, tks ..lb. | ... | .01 | ... | .01 | ... | .01 |
| Ordinary, bbls .......lb. | ... | .01½ | ... | .01½ | ... | .01½ |
| Super spruce ext, tks ...lb. | ... | .01⅝ | ... | .01⅝ | ... | .01⅜ |
| Super spruce ext, bbls ..lb. | ... | .01⅞ | ... | .01⅞ | ... | .01⅞ |
| Super spruce ext, powd, bgs ..................lb. | ... | .04 | ... | .04 | ... | .04 |
| Starch, Pearl, 140 lb bgs ................100 lb. | 3.43 | 3.63 | 3.36 | 3.78 | 2.81 | 3.76 |
| Powd, 140 lb bgs ...100 lb. | 3.53 | 3.73 | 3.46 | 3.66 | 2.71 | 3.66 |
| Potato, 200 lb bgs ......lb. | .04½ | .05½ | .04½ | .06 | .05¼ | .06 |
| Imp, bgs ............lb. | .05¾ | .06 | .05¾ | .06½ | .06 | .06½ |
| Rice, 200 lb bbls .......lb. | ... | .07¼ | .07¼ | .08½ | .07½ | .08½ |
| Wheat, thick bgs .......lb. | ... | .08¼ | ... | .08¼ | .06¼ | .08¼ |
| Strontium carbonate, 600 lb. bbls, wks ...........lb. | .07¼ | .07½ | .07¼ | .07½ | .07¼ | .07½ |
| Nitrate, 600 lb bbls, NY .....................lb. | .08¾ | .09½ | .08¾ | .09½ | .08¾ | .11 |
| Sulfur .................... | ... | ... | ... | ... | ... | ... |
| Crude, f.o.b. mines ....ton | 18.00 | 19.00 | 18.00 | 19.00 | 18.00 | 19.00 |
| Flour, coml, bgs ....100 lb. | 1.60 | 2.35 | 1.60 | 2.35 | 1.60 | 2.35 |
| bbls ............100 lb. | 1.95 | 2.70 | 1.95 | 2.70 | 1.95 | 2.70 |
| Rubbermakers, bgs ..100 lb. | 2.20 | 2.80 | 2.20 | 2.80 | 2.20 | 2.80 |
| bbls ............100 lb. | 2.55 | 3.15 | 2.55 | 3.15 | 2.55 | 3.15 |
| Extra fine, bgs .....100 lb. | 2.40 | 3.00 | 2.40 | 3.00 | 2.40 | 3.00 |
| Superfine, bgs .....100 lb. | 2.20 | 2.80 | 2.20 | 2.80 | 2.20 | 2.80 |
| bbls ............100 lb. | 2.25 | 3.10 | 2.25 | 3.10 | 2.25 | 3.10 |
| Flowers, bgs .......100 lb. | 3.00 | 3.75 | 3.00 | 3.75 | 3.00 | 3.75 |
| bbls ............100 lb. | 3.35 | 4.10 | 3.35 | 4.10 | 3.35 | 4.10 |
| Roll, bgs ..........100 lb. | 2.35 | 3.10 | 2.35 | 3.10 | 2.35 | 3.10 |
| bbls ............100 lb. | 2.50 | 3.25 | 2.50 | 3.25 | 2.50 | 3.25 |
| Sulfur Chloride, red, 700 lb drs, wks ............lb. | .05 | .05½ | .05 | .05½ | .05 | .05½ |
| Yellow, 700 lb drs, wks lb. | .03½ | .04½ | .03½ | .04½ | .03½ | .04½ |
| Sulfur Dioxide, 150 lb cyl lb. | .08½ | .10 | .08½ | .10 | .07 | .10 |
| Multiple units, wks ....lb. | ... | .06½ | ... | .06½ | ... | ... |
| tks, wks ..............lb. | ... | .04¾ | ... | .04¾ | ... | ... |
| Refrigeration, cyl, wks ...lb. | ... | .13 | ... | .13 | ... | ... |
| Multiple units, wks ....lb. | ... | .09¼ | ... | .09¼ | ... | ... |
| Sulfuryl Chloride ........lb. | .15 | .40 | .15 | .40 | .15 | .40 |
| Sumac, Italian, grd ......ton | 60.00 | 65.00 | 50.00 | 65.00 | 58.00 | 75.00 |
| dom, bgs, wks .........ton | ... | 35.00 | ... | 35.00 | ... | ... |
| Superphosphate, 16% bulk, wks ................ton | ... | 8.50 | 8.25 | 8.50 | 8.00 | 8.50 |
| Run of pile ...........ton | ... | 8.00 | 7.75 | 8.00 | 7.50 | 8.00 |
| Talc, Crude, 100 lb bgs, NY ....................ton | 14.00 | 15.00 | 14.00 | 15.00 | 12.00 | 15.00 |
| Refd, 100 lb bgs, NY ton | 16.00 | 18.00 | 16.00 | 18.00 | 16.00 | 18.00 |
| French, 220 lb bgs, NY ton | 22.00 | 30.00 | 22.00 | 30.00 | 27.50 | 30.00 |
| Refd, white, bgs .....ton | 45.00 | 60.00 | 45.00 | 60.00 | 45.00 | 60.00 |
| Italian, 220 lb bgs to arr ton | 70.00 | 75.00 | 70.00 | 75.00 | 70.00 | 75.00 |
| Refd, white, bgs, NY ton | 75.00 | 80.00 | 75.00 | 80.00 | 75.00 | 80.00 |
| Tankage Grd, NY ....unit ¤ | ... | 2.90 | 2.35 | 3.00 | 2.50 | 3.25 |
| Ungrd ...........unit ¤ | ... | 2.60 | 2.15 | 2.50 | 2.00 | 2.75 |
| Fert grade, f.o.b. Chicago ..................unit ¤ | ... | 2.75 | 2.25 | 2.65 | 1.80 | 2.40 |
| South American cif..unit ¤ | ... | 3.15 | 2.45 | 3.15 | 2.75 | 3.10 |
| Tapioca Flour, high grade, bgs ..................lb. | .0215 | .05 | .0215 | .05 | .0215 | .05 |
| Tar Acid Oil, 15%, drs gal. | .22 | .23 | .21 | .23 | .21 | .22 |
| 25%, drs ............gal. | .24 | .25 | .23 | .25 | .23 | .24 |
| Tar, pine, delv, drs .....gal. | .25 | .26 | .25 | .26 | ... | ... |
| tks, delv .............gal. | ... | .20 | ... | .20 | ... | ... |
| Tartar Emetic, tech ......lb. | .24¾ | .25 | .22¾ | .25 | .23 | .23 |
| USP, bbls ............lb. | .28 | .28½ | .28 | .28½ | .27 | .28½ |
| Terpineol, den grd, drs ...lb. | .13¾ | .14¾ | .13¾ | .14¾ | ... | ... |
| tks ...................lb. | .13 | .14 | .13 | .14 | ... | ... |
| Tetrachlorethane, 50 gal drs lb. | .08½ | .09 | .08½ | .09 | .08½ | .09 |
| Tetralene, 50 gal drs, wks lb. | .12 | .13 | .12 | .13 | .12 | .13 |
| Thiocarbanilid, 170 lb bbl lb. | .20 | .25 | .20 | .25 | .20 | .25 |

‡ Bags 15c lower; ¤ + 10.

| | Current Market | | 1935 Low | 1935 High | 1934 Low | 1934 High |
|---|---|---|---|---|---|---|
| Tin, crystals, 500 lb bbls, wks ....lb. | .38½ | .39 | .36 | .39½ | .30 | .40½ |
| Metal, NY ....lb. | .52¼ | .52½ | .456 | .52½ | .50⅞ | .55⅜ |
| Oxide, 300 lb bbls, wks lb. | .54 | .56 | .51 | .58 | .55 | .60 |
| Tetrachloride, 100 lb drs, wks ....lb. | ... | .26¾ | .24¾ | .26¾ | .25½ | .28½ |
| Titanium Dioxide, 300 lb bbls ....lb. | .17¼ | .19¼ | .17¼ | .19¼ | .17¼ | .19¼ |
| Barium Pigment, bbls ....lb. | .06¼ | .06½ | .06¼ | .06½ | .06¼ | .06½ |
| Calcium Pigment, bbls ....lb. | .06¼ | .06½ | .06¼ | .06½ | .06¼ | .06½ |
| Toluol, 110 gal drs, wks gal. | ... | .35 | ... | .35 | ... | .35 |
| 8000 gal tks, frt allowed gal. | ... | .30 | ... | .30 | ... | .30 |
| Toluidine, mixed, 900 lb drs, wks ....lb. | .27 | .28 | .27 | .28 | .27 | .28 |
| Toner Lithol, red, bbls ....lb. | .75 | .80 | .75 | .80 | .75 | .85 |
| Para, red, bbls ....lb. | ... | .75 | ... | .75 | .75 | .80 |
| Toluidine, bgs ....lb. | ... | 1.35 | ... | 1.35 | ... | 1.35 |
| Triacetin, 50 gal drs, wks lb. | .32 | .36 | .32 | .36 | .32 | .36 |
| Triamylamine, drs, wks ...lb. | ... | 1.25 | ... | 1.25 | 1.00 | 1.25 |
| Trichlorethylene, 50 gal drs lb. | .09½ | .10 | .09½ | .10 | .09½ | .10 |
| Triethanolamine, 50 gal drs wks ....lb. | .26 | .30 | .26 | .38 | .35 | .38 |
| tks, wks ....lb. | ... | .25 | ... | ... | ... | ... |
| Tricresyl Phosphate, drs ..lb. | .21 | .23 | .21 | .23 | .19 | .26 |
| Triphenyl Guanidine ....lb. | .58 | .60 | .58 | .60 | .58 | .60 |
| Tripoli, airfloated, bgs, wks ....ton | 27.50 | 30.00 | 27.50 | 30.00 | ... | ... |
| Tungsten, Wolframite per unit | 15.00 | 15.25 | 15.00 | 15.25 | 12.00 | 15.25 |
| Turpentine (Spirits), c-l, NY dock, bbls ....gal. | ... | .49 | .43¾ | .55½ | .46¼ | .63½ |
| Savannah, bbls ....gal. | ... | .44 | .38¾ | .50¼ | .41¼ | .58½ |
| Jacksonville, bbls ....gal. | ... | .43¾ | .38¾ | .50¼ | .41¼ | .58½ |
| Wood Steam dist, bbls, c-l, NY ....gal. | ... | .49 | .43 | .50 | .41 | .61 |
| Urea, pure, 112 lb cases ..lb. | .15½ | .17 | .15½ | .17 | .15 | .17 |
| Fert grade, bgs c.i.f. ..ton | 100.00 | 120.00 | 100.00 | 120.00 | 90.00 | 120.00 |
| c.i.f. S.A. points ....ton | 100.00 | 120.00 | 100.00 | 120.00 | 90.00 | 120.00 |
| Urea Ammonia liq 55% $NH_3$, tks ....unit | ... | .96 | ... | .96 | ... | .96 |
| Valonia beard, 42%, tannin bgs ....ton | ... | 50.00 | 40.00 | 50.00 | 39.00 | 48.00 |
| Cups, 32% tannin, bgs..ton | ... | 34.00 | 26.00 | 34.00 | 23.00 | 32.50 |
| Mixture, bark, bgs ....ton | ... | 32.00 | ... | 32.00 | .. | 32.00 |
| Vermillion, English, kgs ..lb. | 1.58 | 1.71 | 1.48 | 1.71 | 1.41 | 1.73 |
| Vinyl Chloride, 16 lb cyl ..lb. | ... | 1.00 | ... | 1.00 | ... | 1.00 |
| Wattle Bark, bgs ....ton | ... | 30.00 | 29.00 | 32.00 | 29.50 | 34.00 |
| Extract, 60°, tks, bbls ..lb. | ... | .03¾ | ... | .03¾ | .03⅝ | .03⅞ |

WAXES

| | Current Market | | 1935 Low | 1935 High | 1934 Low | 1934 High |
|---|---|---|---|---|---|---|
| Wax, Bayberry, bgs ....lb. | .17½ | .20 | .17½ | .23 | .25 | .30 |
| Bees, bleached, white 500 lb slabs, cases ....lb. | .33½ | .34 | .33½ | .34 | .32 | .37 |
| Yellow, African, bgs ..lb. | .23½ | .24½ | .21 | .24½ | .16 | .22 |
| Brazilian, bgs ....lb. | .23 | .25 | .21½ | .25 | ... | ... |
| Chilean, bgs ....lb. | .23 | .25½ | .21½ | .25½ | ... | ... |
| Refined, 500 lb slabs, cases ....lb. | .27½ | .28 | .27½ | .28 | .21 | .29 |
| Candelilla, bgs ....lb. | .16 | .17½ | .10 | .17½ | .10¼ | .14½ |
| Carnauba, No. 1, yellow, bgs ....lb. | .52 | .54 | .35 | .54 | .30 | .40 |
| No. 2, yellow, bgs ....lb. | .48 | .50 | .34 | .51 | .34 | .41 |
| No. 2, N. C., bgs ....lb. | .42 | .43 | .26½ | .43½ | .20 | .29 |
| No. 3, Chalky, bgs ...lb. | .39 | .41 | .21 | .42½ | ... | ... |
| No. 3, N. C., bgs ....lb. | .40 | .42 | .22½ | .43 | .16¼ | .25 |
| Ceresin, white, imp, bgs lb. | .43 | .45 | .43 | .45 | ... | ... |
| Yellow, bgs ....lb. | .36 | .38 | .36 | .38 | ... | ... |
| Domestic, bgs ....lb. | .08 | .11 | .08 | .11 | ... | ... |
| Japan, 224 lb cases ....lb. | .08¾ | .09 | .06 | .09 | .06 | .07½ |
| Montan, crude, bgs ....lb. | .10¾ | .11¾ | .10½ | .11¾ | .10 | .11 |
| Paraffin, see Paraffin Wax. | | | | | | |
| Spermaceti, blocks, cases lb. | .22 | .24 | .19 | .24 | .18 | .20 |
| Cakes, cases ....lb. | .23 | .25 | .20 | .25 | .19 | .21 |
| Whiting, prec 200 lb bgs, c-l, wks ....ton | ... | 15.00 | 12.00 | 15.00 | ... | ... |
| Alba, bgs, c-l, NY ....ton | ... | 15.00 | ... | 15.00 | ... | 15.00 |
| Gliders, bgs, c-l, NY ...ton | ... | 15.00 | ... | 15.00 | ... | ... |
| Wood Flour, c-l, bgs ....ton | 18.00 | 30.00 | 18.00 | 30.00 | 18.00 | 30.00 |
| Xylol, frt allowed, East 10° tks, wks ....gal. | .31 | .33 | .27 | .33 | .27 | .29 |
| Coml, tks, wks, frt allowed ....gal. | ... | .30 | .26 | .30 | ... | .26 |
| Xylidine, mixed crude, drs lb. | .36 | .37 | .36 | .37 | .36 | .37 |
| Zinc, Carbonate tech, bbls, NY ....lb. | .09½ | .11 | .09½ | .11 | .09½ | .11 |
| Chloride fused, 600 lb drs, wks ....lb. | .04½ | .05¾ | .04½ | .05¾ | .04¼ | .05¼ |
| Gran, 500 lb bbls, wks ..lb. | .05 | .05¾ | .05 | .05¾ | .05⅛ | .06 |
| Soln 50%, tks, wks..100 lb. | ... | 2.00 | ... | 2.00 | ... | 2.00 |
| Cyanide, 100 lb drs ....lb. | .36 | .41 | .36 | .41 | .36 | .41 |
| Zinc Dust, 500 lb bbls, c-l, delv ....lb. | ... | .0685 | .057 | .0685 | .0567½ | .071 |
| Metal, high grade slabs, c-l, NY ....100 lb. | ... | 5.22 | 4.05 | 5.22 | 4.05 | 4.75 |
| E. St. Louis ....100 lb. | ... | 4.85 | 3.70 | 4.85 | 3.70 | 4.46 |
| Oxide, Amer, bgs, wks..lb. | .05 | .05½ | .05 | .06¼ | .05¾ | .06¼ |
| French, 300 lb bbls, wks ....lb. | .05½ | .07 | .05½ | .10⅞ | .05¾ | .11⅛ |
| Palmitate, bbls ....lb. | .22 | .23 | .21 | .23 | .20 | .22 |
| Perborate, 100 lb drs ...lb. | ... | 1.25 | ... | 1.25 | ... | 1.25 |
| Peroxide, 100 lb drs ...lb. | ... | 1.25 | ... | 1.25 | ... | 1.25 |
| Resinate, fused, dark, bbls lb. | .05¾ | .06½ | .05¾ | .06½ | .05¾ | .06½ |
| Stearate, 50 lb bbls ....lb. | .19 | .22 | .18 | .22 | .18 | .21 |

| | Current Market | | 1935 Low | 1935 High | 1934 Low | 1934 High |
|---|---|---|---|---|---|---|
| Zinc Sulfate, crys, 400 lb bbl, wks ..........lb. | .028 | .033 | .028 | .033 | .02¾ | .033 |
| Flake, bbls ..........lb. | .035 | .032 | .035 | .032 | ... | ... |
| Sulfide, 500 lb bbls, delv lb. | .10¾ | .11¾ | .10¾ | .11¾ | .10¾ | .13½ |
| bgs, delv ..........lb. | .10½ | .11½ | .10½ | .11½ | ... | ... |
| Sulfocarbolate, 100 lb kgs ..........lb. | .24 | .25 | .24 | .25 | .21 | .25 |
| Zirconium Oxide, Nat kgs lb. | .02½ | .03 | .02½ | .03 | .02½ | .03 |
| Pure, kgs ..........lb. | .45 | .50 | .45 | .50 | .45 | .50 |
| Semi-refined, kgs ......lb. | .08 | .10 | .08 | .10 | .08 | .10 |

### *Oils and Fats*

| | Current Market | | 1935 Low | 1935 High | 1934 Low | 1934 High |
|---|---|---|---|---|---|---|
| Castor, No. 3, 400 lb bbls..lb. | .10 | .10¾ | .09¾ | .10¾ | .09¾ | .10½ |
| Blown, 400 lb bbls .....lb. | .12¼ | .13 | .11½ | .16 | .11½ | .12¾ |
| China Wood, bbls spot NY lb. | .18 | .19 | .094 | .40 | .07½ | .099 |
| Tks, spot NY .......lb. | .17 | .18 | .088 | .35 | .07¼ | .094 |
| Coast, tks ...........lb. | .13¼ | .13½ | .087 | .24 | .06⅞ | .094 |
| Coconut, edible, bbls NY..lb. | ... | .10¼ | .04 | .12 | .04¾ | .10¾ |
| Manila, tks, NY .......lb. | ... | .04¾ | .03¾ | .06¼ | .02⅝ | .03¾ |
| Tks, Pacific Coast ...lb. | .04¼ | .04⅜ | .03⅜ | .06 | .02¼ | .02½ |
| Cod, Newfoundland, 50 gal bbls ...............gal. | .35 | .36 | .34 | .38 | .34 | .40 |
| Copra, bgs, NY .........lb. | .0235 | .0245 | .02 | .038 | .0012 | .021 |
| Corn, crude, tks, mills ....lb. | .09¾ | .09⅞ | .08¾ | .11 | .03½ | .09½ |
| Refd, 375 lb bbls, NY ..lb. | .11¾ | .12¼ | .11½ | .14 | .05¾ | .12 |
| Cottonseed, see Oils and Fats News Section. | | | | | | |
| Degras, American, 50 gal bbls, NY .. .. .........lb. | .05¼ | .06¾ | .04½ | .06 | .02¾ | .05½ |
| English, brown, bbls, NY lb. | .04¾ | .05½ | .04¾ | .06½ | .03¾ | .05⅜ |
| Greases, Yellow .. ......lb. | .06⅛ | .06⅜ | .05 | .06¾ | .02⅜ | .05⅛ |
| White, choice bbls, NY lb. | .06⅜ | .07½ | .05¼ | .08½ | .02¾ | .05⅝ |
| Herring, Coast, tks ......gal. | .33 | Nom. | .23 | .33 | .15 | .23 |
| Lard Oil, edible, prime ...lb. | ... | .17½ | .09¾ | .20½ | ... | .09¾ |
| Extra, bbls ............lb. | ... | .12½ | .08½ | .11¾ | .07 | .08½ |
| Extra, No. 1, bbls ......lb. | ... | .10¾ | .08¼ | .11 | .06⅜ | .08¼ |
| Linseed, Raw, less than 5 bbl lots ..... ..........lb. | .1110 | .1130 | .091 | .1130 | .101 | .105 |
| bbls, c-l spot ........lb. | ... | .097 | .083 | .097 | .087 | .101 |
| Tks ................lb. | ... | .091 | .0770 | .091 | .081 | .095 |
| Menhaden, tks, Baltimore gal. | ... | .32½ | .25 | .35 | .15 | .25 |
| Refined, alkali, drs ....lb. | .076 | .08 | .061 | .08 | .052 | .069 |
| Tks ...............lb. | ... | .07 | .055 | .07 | .046 | .061 |
| Light pressed, drs ......lb. | .072 | .076 | .055 | .076 | .046 | .057 |
| Tks .... .......... lb. | ... | .066 | .049 | .066 | .04 | .05 |
| Neatsfoot, CT, 20° bbls, NY ........ .. ........lb. | ... | .16½ | .16¼ | .16¾ | ... | .16½ |
| Extra, bbls, NY .......lb. | ... | .11 | .08½ | .11¼ | .07 | .08½ |
| Pure, bbls, NY ........lb. | ... | .13½ | .11¾ | .13¼ | .12 | .13 |
| Oleo, No. 1, bbls, NY ....lb. | ... | .13¾ | .10¾ | .14½ | .06 | .11½ |
| No. 2, bbls, NY .......lb. | ... | .12¾ | .10 | .13¾ | .05⅜ | .11¼ |
| Olive, denat, bbls, NY ...gal. | .66 | .87 | .82 | .95 | .76 | .90 |
| Edible, bbls, NY ......gal. | 1.65 | 1.90 | 1.55 | 1.90 | 1.55 | 1.90 |
| Foots, bbls, NY .......lb. | .09⅜ | .09⅝ | .07⅛ | .10 | .06½ | .07½ |
| Oticica, bbls ............lb. | .15 | .16 | .13½ | .28 | ... | ... |
| Palm, Kernel, bulk .......lb. | ... | .046 | ... | ... | ... | ... |
| Niger, cks ............lb. | ... | .05 | .034 | .05¾ | .031 | .03¾ |
| Sumatra, tks ..........lb. | ... | .04¾ | ... | ... | ... | ... |
| Peanut, crude, bbls, NY ..lb. | ... | .10 | ... | ... | ... | ... |
| Tks, f.o.b. mill ........lb. | ... | .09½ | .08¾ | .10¾ | .06½ | .10¾ |
| Refined, bbls, NY ......lb. | ... | .13½ | .12½ | .14 | .07½ | .12½ |
| Perilla, drs, NY .........lb. | .08⅝ | .08¾ | .07¼ | .10¼ | .08¼ | .09⅝ |
| Tks, Coast ............lb. | ... | .08¼ | .068 | .08½ | .07½ | .09 |
| Pine, see Pine Oil, Chemical Section. | | | | | | |
| Rapeseed, blown, bbls, NY lb. | .08 | .083 | .07½ | .09 | .08 | .082 |
| Denatured, drs. NY ...gal. | .53 | .55 | .40 | .53 | .37 | .44 |
| Red, Distilled, bbls ......lb. | .09⅝ | .10⅝ | .07⅜ | .10⅝ | .06⅞ | .08⅜ |
| Tks .. .. .. .........lb. | ... | .08¾ | .06½ | .08¾ | .06 | .06½ |
| Salmon, Coast, 8000 gal tks ....................gal. | ... | .31 | .25 | .35 | .15 | .21 |
| Sardine, Pac Coast, tks ..gal. | ... | .38 | .24½ | .37½ | .13 | .25 |
| Refined alkali, drs ......lb. | .078 | .082 | .065 | .082 | ... | ... |
| Tks ................lb. | ... | .072 | .06 | .072 | ... | ... |
| Light pressed, drs ......lb. | .072 | .076 | .055 | .076 | ... | ... |
| Tks ................lb. | ... | .066 | .049 | .066 | ... | ... |
| Sesame, yellow, dom .....lb. | .14½ | .15 | .12¼ | .15 | .07½ | .13¼ |
| White, dos .. ..........lb. | .14½ | .15 | .12¾ | .15 | .08 | .13¼ |
| Soy Bean, crude | | | | | | |
| Dom, tks, f.o.b. mills ..lb. | ... | .09 | .08 | .10 | .06 | .08 |
| Crude, drs, NY ......lb. | .096 | .10 | .086 | .11 | .066 | .09 |
| Refd, bbls, NY ........lb. | .101 | .11 | .091 | .115 | .071 | .102 |
| Tks .. .. ..........lb. | .095 | .10 | .08 | .10½ | ... | ... |
| Sperm, 38° CT, bleached, bbls NY ................lb. | .099 | .101 | .099 | .101 | .106 | .11 |
| 45° CT, bleached, bbls, NY .... ................lb. | .092 | .094 | .092 | .094 | .099 | .103 |
| Stearic Acid, double pressed dist bgs ............lb. | .10 | .11 | .10 | .12¼ | .09 | .11 |
| Double pressed saponified bags ...... ........ lb. | .10½ | .11½ | .09 | .12¾ | .09 | .10 |
| Triple pressed dist bgs ..lb. | .12¾ | .13¾ | .12¾ | .15¼ | .11¾ | .13¾ |
| Stearine, Oleo, bbls ......lb. | .11½ | .13¼ | .09¼ | .12½ | .05 | .10⅝ |
| Tallow City, extra loose ..lb. | ... | .06⅞ | .05⅜ | .07⅜ | .07⅞ | .05⅜ |
| Edible, tierces .........lb. | ... | .09¼ | .07¼ | .09¼ | .04¾ | .07¼ |
| Acidless, tks, NY ......lb. | ... | .10 | .07½ | .10¾ | .06 | .07½ |
| Turkey Red, single, bbls ..lb. | .08 | .08½ | .07½ | .08½ | .07½ | ... |
| Double, bbls ...........lb. | .13 | .13½ | .12½ | .13½ | .12½ | .13 |
| Whale: | | | | | | |
| Winter bleach, bbls, NY lb. | .079 | .081 | .07 | .083 | ... | .072 |
| Refined, nat, bbls, NY ..lb. | ... | .075 | .064 | .081 | .064 | .07 |

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**ANILINE OIL**

*Heavy Chemicals*
*Textile Specialties*

**J. U. STARKWEATHER CO.**

INCORPORATED

705 Hospital Trust Bldg.
Providence, R. I.

**INDUSTRIAL CHEMICALS**
AND
**BASIC RAW MATERIALS**

Serving N. Y. State, Penna.
and Canadian Industry
Since 1915

**ROLLS CHEMICAL COMPANY**

Ellicott Sq. Bldg., Buffalo, N. Y.

**E. & F. KING & Co., Inc.**

Est. 1834

399-409 Atlantic Avenue
Boston, Mass.

*Industrial Chemicals*

($CO_2$)

*Solid Carbon Dioxide*

# THE CHEMICAL MARKET-PLACE

## *Wants & Offers*

Rates—All classifications, $1.00 an insertion for 20 words or less, additional words 5c each per issue: 10c for forwarding mail if box number address is used. ¶ Three insertions for the price of two. Payment with order.

Chemical Industries
25 Spruce St., New York

### Situations Wanted

AGRICULTURAL COLLEGE GRADUATE with seven years' sales and sales promotion experience in fertilizer and insecticide fields and experiment station experience wishes position in agricultural field. Now employed. Box 1116, CHEMICAL INDUSTRIES.

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ANALYTICAL AND OPERATING CHEMIST having four years' work in yeast making, and five years' in photography. Box 684, CHEMICAL INDUSTRIES.

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ASSISTANT CHIEF CLERK — Two years' experience and now employed by one of the largest Alkali and Chemical producers. Desires connection with firm with possibilities for advancement. Location unimportant. Can furnish A1 references. Box 1132, CHEMICAL INDUSTRIES.

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BIOCHEMIST, B.S. Four years' manufacturing and laboratory experience with canned and preserved foods. Graduate study in Physiological Chemistry. Read French, German. Age 27. Box 1130, CHEMICAL INDUSTRIES.

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CHEMICAL ENGINEER with experience in water softening, steel, and artificial leather. Box 686, CHEMICAL INDUSTRIES.

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CHEMICAL GRADUATE wishes translation work for German—or chemical library work. Box 683, CHEMICAL INDUSTRIES.

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CHEMIST who has had eight years' work in materials research for airplane construction. Box 681, CHEMICAL INDUSTRIES.

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EXECUTIVE, CHEMICAL-METALLURGICAL—Advertiser, constantly employed for past twenty years in technical and executive capacities (and at present employed) is seeking larger responsibilities with progressive concern. Experienced in management and technical capacity; workers' activities; company paper, etc. Mechanical bent; market minded and can sell. Technical graduate and additional training in economics; publications, technical and economic. Should make excellent assistant to busy president or works manager. Box 1131, CHEMICAL INDUSTRIES.

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MANUFACTURING CHEMIST experienced in filament wires for lamps and radio work. Box 682, CHEMICAL INDUSTRIES.

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RESEARCH and OPERATING CHEMIST for manufacture of heavy chemicals; also pharmaceutical experience. Box 685, CHEMICAL INDUSTRIES.

### Situations Wanted

SALES REPRESENTATIVE for firm with products of merit to the paper manufacturing industry. Man 39 years old, university training, with wide acquaintance in and knows the paper industry. Experienced in marketing, including advertising, sales promotion, sales. Not a chemist. Box 1118, CHEMICAL INDUSTRIES.

### For Sale

FOR SALE—One Ferguson Packomatic Semi-automatic carton filling, sealing and weighing machine with complete assembly. Equipped with Monitor elevator, bucket size 3" by 3", capacity 30 bag per hour, fully equipped with covered boot and ½ H.P. G.E. motor, 220 volt. Used but short time for packaging Tri Sodium Phosphate. Low price for quick sale. Write Baldwin Laboratories, Inc., Saegertown, Pennsylvania.

### Business Opportunities

A LARGE CHEMICAL MANUFACTURING CORPORATION with widely diversified activities invites information concerning products which might form additions to its present lines, or furnish the basis for new lines. Contacts will be arranged with those who supply sufficient information in their initial letter to make possible at least a rough appraisal of the attractiveness of the proposal. Box 1117, CHEMICAL INDUSTRIES.

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NEW PROCESSES OR NEW PRODUCTS: Chemical Manufacturer desires contact with men who have new processes for products with established markets, or for new products with potential markets. Box 1112, CHEMICAL INDUSTRIES.

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YOU may have a waste product which may have some value. Send sample and particulars to International Products Corporation, Trenton, N. J.

### Business Opportunities

PHTHALLIC ANHYDRIDE. English firm wish to purchase plans for the erection of a plant to produce phthallic anhydride. Opening for Chemist with previous experience of operating plant. Box 1123, CHEMICAL INDUSTRIES.

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RIO DE JANEIRO REPRESENTATION—Reputable importing house of industrial chemicals representing outstanding European and American firms now prepared to handle additional representations. Manufacturers interested in introducing their line on the Brazilian market please communicate with B. Herzog, Rua General Camara, 211/213 Rio de Janeiro; or with representative now in New York, A. Brickman, 2313 East 23rd St., Brooklyn, N. Y.

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CHEMICAL ENGINEER desires contact financial interests with view establishing chemical manufacturing enterprise. Number years experience manufacture copper, zinc and barium chemicals direct from ores. Box 1120, CHEMICAL INDUSTRIES.



**EXCEPTIONAL OPPORTUNITY**

**For**

## Paint Chemist

An important position is open for Chemist with leading manufacturer of Paints, Varnishes and Enamels. Must be thoroughly familiar with the manufacture of Alkyd type of resins and their application to interior and exterior paints and enamels, also baking enamels. Would also consider experience with phenol type of resins.

***Salary — $6,000 to $10,000 per year depending upon experience and qualifications***

This job will appeal to the experienced, successful Chemist, who is now employed but who wishes to change to a position with exceptional opportunities.

Only men of unusual ability with good background of experience along the lines of synthetic resins will be considered.

Location of plant—Newark, New Jersey.

Give full history, including training, age, experience in first letter. Replies will be held confidential; our staff has seen this advertisement.

Box 1133 Chemical Industries

# *Index to Advertisers*

# *Index to Advertisers*

# "We"—Editorially Speaking

In good old medieval times the schoolmen and the churchmen used to debate how many angels could stand on the head of a pin, and we are indebted indeed to the publicity department of Monsanto for having made to this ancient controversy the contribution that 5,850,000 particles of their dicalcium phosphate could be accommodated on the same restricted area.

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A shrewd, carefully trained, exacting purchasing agent, who steadfastly refuses to take business as an everlasting, deadly serious matter, contributes, out of his expert experience of a business lifetime spent with the Philadelphia Quartz Company, an article, at once informative and entertaining, on the unusual uses of silicates. Mr. Elkinton will be most pleasantly remembered by our readers as the author of an equally valuable and amusing article on barrels, entitled "Diogenes in Half a Barrel."

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The antiquity of some mailing lists used is positively antediluvian, and first prize for out-of-dateness may properly go to the chemical company which recently addressed a circular to "C. H. Hazard, Purchasing Agent, The American Synthetic Color Company, Stamford, Conn." This lusty war-baby was taken over by the U. S. Government in 1917. Mr. Hazard denies indignantly that the chemical company using this antique address book is one of his advertising clients.

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The President of the Petroleum Institute is quoted by Sir John Cadman as saying: "Kindly Providence never fails to provide ample supplies of a material as valuable as petroleum"—oh, yeah—and, Mr. Byles, what about the great auk?

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Did you know—

That Mrs. August Merz poured at the Woman's Engineering Club's tea to Mrs. Herbert Hoover?

That H. L. Derby is Chairman of the New Jersey Social Security Commission?

That carving wooden miniature ducks and other game birds is one of the hobbies of William M. Rand?

That A. Cressy Morrison is Chairman of the Board of Directors of the Hayden Planetarium Committee and was largely instrumental in raising the funds which made this possible?

That, in Cleveland, Ohio, the floors of the General Electric Lamp works built 15-20 years ago, have now risen 15 inches because of oxidation of pyrite (iron sulfide) in the strata below because of the entrance of oxygen from the air?

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One year ago "we" said editorially: "To date the President's leadership has inspired action—swift, bold action adopted, as he has frankly confessed, as experiments. Many of these have been prompted by mixed motives. Some of the experiments have been so contradictory as to cancel each other. Most of them have flatly repudiated the historical principles of the Democratic party, and several are highly repugnant to the ancient faiths of the Republic. Very few of these bold acts, however, give evidence of having been thought through to logical conclusions.

"No merit attaches to an experiment unless it reveals new knowledge, and the President must by now have learned much of practical value from experience. What is now needed is a plan which will embody the ideals of the New Deal worked out carefully upon the basis of the facts revealed by the trial and error methods of the past two years, and the President has a glorious chance at the moment to furnish a leadership in constructive thought which will capitalize not only his popularity, but also his program." It begins to look as if Mr. Roosevelt had merely wasted another year.

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Acid Test: Undoubtedly there is something wrong with this 3.2 product when, after sixty days of it, nobody tries to sing "Good Night Ladies," or step through a coal chute backward. *Lexington* (Ky.) *Herald*.

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The claim in United States Letters Patent 2,008,157 reads as follows: "Compounds of the class consisting of 4-methylamino-1, 2, 5, 6-diphthaloylacridone; 4-anilido-1, 2, 5, 6-diphthaloylacridone; 4-anthraquinonylamino-1, 2, 5, 6-diphthaloylacridone; bis-4, 4′ (1, 2, 5, 6-diphthaloyl-acridonyl) -p-phenylene-diamine; 4-hydroxy-1, 2, 5, 6-diphthaloylacridone; 4-phenoxy-1, 2, 5, 6-diphthaloylacridone; 4-mercapto-1, 2, 5, 6-diphthaloylacridone."—Some class!

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Coming in January—first hand reviews of the developments of chemical progress in England and the United States. Also, the story of the Scotch acid maker who founded the company that has grown into the Merrimac Chemical Company and, just for good measure, a most entertaining interview with A. Cassels Brown, entitled "Chemical Industry Upside Down."

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Our display at the Chemical Exposition, "The New Chemicals of Commerce" is going "on the road" next month. Colleges, museums, and conventions are all slated to see these three hundred new chemical products developed and marketed during 1934 and 1935 by our advertisers. Reservations for this exhibit may still be made.

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We have been to the Fashion Show at the Graphic Arts Exhibit and next year will appear in a new dress of modern design in streamline vogue.

### *Fifteen Years Ago*

***From our issues of December, 1920***

**Swift & Company are making arrangements for enlargement of the fertilizer factory at Curtis Bay, Baltimore, Md.**

**Professor John Uri Lloyd, 71 years old, is seriously ill at his home in Cincinnati.**

**Allied Chemical & Dye Corp., incorporated, Manhattan.**

**Lambert Chemical Co., St. Louis, Mo., files petition in bankruptcy.**

**Henry Wigglesworth, General Chemical, returns after extended business trip to Europe.**

**Pierre S. du Pont elected president of General Motors.**

**Rogers-Pyatt Shellac holds first annual dinner at Pennsylvania Hotel, New York.**

**Victor Chemical opens sales office at Nashville, Tenn.**

**New plan announced by du Pont for stock subscription by employees by which they will receive not only a fixed cumulative dividend, but also a participating payment at a rate increasing with the net earnings of the company.**